ONEOS V4.3R4

ONEOS V5.1R3

IBC USER GUIDE

(EDITION 10)

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1 INTRODUCTION

This edition of the IBC user guide corresponds to the V4.3R4E21 and V5.1R3E1 software releases of OneOS. It is also available for all previous software releases of OneOS according to the features matrix described hereafter.

IBC stands for IP Business Communication. The IBC module is a voice application empowering OneOS to deliver advanced voice features to a wide variety of phone subscribers: analog and ISDN phone, PBX trunks, SIP phones (wired, wireless and dual-mode).

The present manual is divided into two parts:

- A user's guide: describing briefly the services offered by voice features and how to activate/de-activate/use them.
- An administrator's guide: dealing with advanced voice feature description, user provisioning, and service configuration and monitoring.

This document is the OneOS user guide for IBC-related functions of the OneOS-based range products that are voice enabled.

Seven other user guides and two global indexes are available:

- OneOS – Admin User Guide
- OneOS – Bridging & LAN User Guide
- OneOS – Basic IP User Guide
- OneOS – Advanced IP User Guide
- OneOS – WAN User Guide
- OneOS – VoIP User Guide
- OneOS – VoATM & CES User Guide
- Index of OneOS User Guides (global table of contents)
- Index of CLI of OneOS User Guides (global list of CLI commands)

1.1 FEATURE MATRIX

Main Function	Feature	Present at least in:
Trunk Interface	ISDN BRI / PRI	V4.1R3E1
	FXO	V4.1R3E1
	H.323	V4.1R3E1
	SIP	V4.1R3E1
	Backup routing of H.323/SIP to FXO/ISDN trunk	V4.1R3E1
	IAX2	V4.2R6E5
Subscribers	FXS phones	V4.1R3E1
	ISDN phones	V4.1R3E1
	SIP phones	V4.1R3E1
	MAC-based SIP phone authentication	V4.1R3E1
	Username/password based SIP phone authentication	V4.1R3E1
	Keypad-based telephone installation	V4.1R3E1
	Auto-installation of SIP phones: Aastra and Thomson	V4.1R3E1
	Directory provisioning for Aastra and Thomson phones	V4.1R5E6
	Auto-installation of SIP phones: Linksys, LG-Nortel and Polycom	V4.2R3E6
Voice Features	Profile to restrict access to some services	V4.1R3E1
	Do Not Disturb (DND)	V4.1R3E1
	Redial last called, last calling, or missed call	V4.1R3E1
	Call Forwarding Unconditional (CFU)	V4.1R3E1
	Daily CFU	V4.1R3E1
	Weekly CFU	V4.1R3E1
	Call Forwarding on Busy (CFB)	V4.1R3E1
	Call Forwarding on No Reply (CFNR)	V4.1R3E1
	Call Forwarding on Disconnected (CFD)I	V4.1R3E1
	Allow/disable multiple call forwards	V4.1R3E1
	Choose voice mail in case of multiple call forwards (first / last called)	V4.1R3E1
	Follow-me service	V4.1R3E1
	Boss/secretary filtering: forbid call forward, vocal announcements at off-hook	V4.1R3E1
	Call waiting / Disable call waiting	V4.1R3E1
	Internal voice mail	V4.1R3E1
	MWI for internal voice mail	V4.1R3E1
	Ability to call back the one who left a voice mail	V4.1R3E1
	Customizable IVR	V4.1R3E1
	Music on hold	V4.1R3E1
	Vocal CLIP	V4.1R3E1
	Call Completion on Busy Subscriber (CCBS)	V4.1R3E1
	Call pickup	V4.1R3E1
	Personal ringback message	V4.1R3E1
	Hunt group: cyclic, simultaneous, cyclic with differentiated priority levels	V4.1R3E1
	Directory service (speed dial)	V4.1R3E1

Main Function	Feature	Present at least in:
	Locking outgoing calls	V4.1R3E1
	Login: shared, permanent, one-call	V4.1R3E1
	Restricting outgoing calls for defined patterns	V4.1R3E1
	Caller Number Identification (CNIP)	V4.1R3E1
	Calling Line Identification Presentation (CLIP)	V4.1R3E1
	Calling Line Identification Restriction (CLIR)	V4.1R3E1
	Default-routing (route to pre-defined number if the called party is unknown)	V4.1R3E1
	General ringing	V4.1R3E1
	Management of dual-phones & external voice mail support	V4.1R4E2
	Name presentation on FXS	V4.1R4E2
	FXS second call + transfer (FXS user can have two calls on-hold + 1 active)	V4.1R4E2
	Retrieving a forwarded call	V4.1R4E2
	Internal voice mail can be configured as simple answering machine	V4.1R4E2
	Ability to load a sound file for ringback or music on hold	V4.1R4E2
	Call pickup only in the configured hunt group	V4.1R4E2
	Ringback configurable per user or per trunk	V4.1R4E2
	Login as wired phone / permanent login	V4.1R4E2
	External calls can be forbidden	V4.1R4E2
	Installation profiles and default installation profile	V4.1R4E2
	Customizable language per user	V4.1R4E2
	Presence monitoring of other users	V4.1R4E2
	Monitoring of CFU destined to an user	V4.1R4E2
	Time limit for tromboned communications	V4.1R4E2
	New attributes per number: role, contact, email, firstname	V4.1R4E2
	Use of **`<firstname>.<name>`** as web login	V4.1R4E2
	Alternate external identity to be presented when calling on the network	V4.1R5E4
	Keypad to join directly voicemail of the called party	V4.1R5E4
	Scheduled call forward to voicemail	V4.1R5E4
Voice Features (FXS phone)	CLIP	V4.1R3E1
	Attended call transfer	V4.1R3E1
	3-way conference	V4.1R3E1
	Hold	V4.1R3E1
	2nd call	V4.1R3E1
	Brokering	V4.1R3E1
	Call Waiting	V4.1R3E1
	MWI	V4.1R3E1
Voice Features (ISDN phone)	CLIP, CNIP, CLIR	V4.1R3E1
	Attended call transfer (ECT)	V4.1R3E1
	3-way conference (3PTY)	V4.1R3E1
	Hold / Retrieve / Brokering	V4.1R3E1
	MWI	V4.1R3E1
	ISDN call forwards (CFU, CFB, CFNR)	V4.1R3E1
Voice Features (SIP phone)	CLIP, CNIP, CLIR	V4.1R3E1
	Attended call transfer (REFER method)	V4.1R3E1
	3-way conference (managed by SIP phone)	V4.1R3E1
	Hold / Retrieve / Brokering	V4.1R3E1
	MWI	V4.1R3E1
	Phone based call forwards (302 response)	V4.1R3E1
Phone functions	CLI command to dial (basis for the click-to-dial function)	V4.1R3E1

Main Function	Feature	Present at least in:
	Journalized call logs	V4.1R3E1
	SNTP Relay for phones	V4.1R5E4
Miscellaneous	TFTP Relay for phones software upgrade	V4.1R5E4
	Multi information space to store user info.	V4.1R5E4
	Save and restore functions for system backup	V4.1R5E4
	SMTP Authentication for voice-to-email	V4.1R5E5
	DHCP Vendor ID phone recognition for auto provisioning	V4.1R5E5
	IBC RTP port range customization	V4.1R5E6
	CSTA interface for click and dial TAPI application	V4.2R3E6
	WiFi to GSM handover	V4.2R4E2
	Busy Lamp Function (BLF)	V4.2R4E2
	Simultaneous ringing	V4.2R4E2
	Number presentation customization	V4.2R4E2
	Wav files loading	V4.2R4E2
	LDAP server for directory provisioning	V4.2R5E7
	CSV files loading	V4.2R5E7

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2 USER'S GUIDE

IBC USER'S GUIDE

2.1 USER'S GUIDE WITH PHONE KEYPAD

This chapter deals with voice feature description and activation codes.

2.1.1 Conventions

Actions / Events on Phone	Meaning
📞	The user picks up the phone.
# * 0 1 2 3 4 5 6 7 8 9	The user presses some keys on its phone keypad.
☎	The user hangs up the phone.
▦	The user dials a sequence of digits. The sequence can correspond to a code or a phone number.
R	The user presses hook flash button (analog phones only).
☎ ooo ☎	Telephone call is in progress.

Warning

With traditional phones, the user must 1) pick up the phone 2) dial the phone number 3) wait for connection. With IP phones, the user may have to press an extra button to start the call after dialing the phone number.

2.1.2 Essential Keypad Codes for Most Common Services

Keypad Sequence	Service
* 5 1	Redial last Missed call
* 2 8 * ▦ ↖ Forward-to phone number	Unconditional Call Forward
* 2 0	Canceling all Call Forwards
* 7 4 * ▦ ↖ Short code	Speed Dial
8 8 8	Interrogating and Configuring Voice Mail

2.1.3 Essential Keypad for Boss / Assistant Filtering

Keypad for Manager(s)

Keypad Sequence	Service
28 ⌨ ↖ Secretary number	Forward all calls to secretary
27 ⌨ ↖ Secretary number	Forward calls to secretary only if unavailable or busy or not responding
*20	Canceling all Call Forwards

Keypad for Secretary

Keypad Sequence	Service
*33*2	Activating announcement of the caller number and which manager has forwarded the call. (in the event a secretary has got several managers, an announcement of forwarding manager is told to the secretary)
*33*3	Activating announcement of which manager has forwarded the call (in the event a secretary has got several managers, an announcement of forwarding manager is told to the secretary)
*33*4	Activating announcement of which manager has forwarded the call and manager availability (when a call destined to the manager is forwarded to the secretary, an announcement telling manager status – busy, unavailable, …- is told to the secretary)
*33*5	Activating all possible Forwarding announcements (the announcement tells the caller number, which manager forwarded the call and the manager status)
*33*0	De-activating all announcements
*89*1	Rejecting forwarded calls (if the secretary is away from office, he/she may disable call forwarding from manager, so that the manager receives the calls)
*89*0	Accepting again call forwards (when the secretary is back to office)

2.1.4 Advanced Services with Analog Phones

The services described in this section are only relevant for FXS phones attached to an IBC router.

2.1.4.1 Call Waiting

When an FXS subscriber has got one call in progress and a second call destined to that subscriber comes in, the FXS subscriber hears a call waiting tone and the caller hears the phone ringing. The FXS subscriber may decide to put the active call on-hold (therefore the remote party placed on-hold hears the music-on-hold).

Call Waiting: Putting Active Call on-Hold and Accepting Second Call

Actions / Events on Phone	Comments
☎ooo☎	One call is active.
"Beep"	The call waiting tone is played.
R 1 or R 2	Press hook flash button followed by 1 or 2.
☎ooo☎	You are connected with second caller.

2.1.4.2 Second Call

When a call is active, it is possible to put this call on hold, and then to call a second subscriber.

Making a Second Call

Actions / Events on Phone	Comments
☎ooo☎	One call is active.
R	Press hook flash button.
⌨	A dialing tone is played. Dial the phone number of another subscriber.
☎ ring!	IBC attempts to connect the call with the new subscriber.

2.1.4.3 Releasing Second Call

When a call is active and one on-hold, you can release the currently active call and switch to the other one.

Releasing Second Call

Actions / Events on Phone	Comments
☎ooo☎	One call is active, one is on-hold.
R 1	Press hook flash button followed by 1.
☎ooo☎	You are now connected with the remote party that was on-hold. The remote that was previously active is now disconnected.

2.1.4.4 Brokering

Brokering is feature related to an FXS subscriber having two SIP call legs. It refers to the action of switching between calls, i.e. putting one call on-hold and retrieving the other call (that was on-hold). The party on-hold hears the music-on-hold.

Brokering

Actions / Events on Phone	Comments
☎ooo☎	Two calls are connected (one active, one on-hold.
R 2	Press hook flash button followed by 2.
☎ooo☎	You are now in communication with the party previously on-hold. The formerly active party is now on-hold.

2.1.4.5 Attended Call Transfer

Attended call transfer is also called call transfer with consultation.

A is an FXS subscriber. A is in conversation with B. A puts B on hold. A calls C. A asks C if he wants to talk to B. Then, A initiates a call Transfer, so that B talks to C and calls from A to B or C are released.

Attended Call Transfer

Actions / Events on Phone	Comments
☎ooo☎	One call is active.
R	Press hook flash button.
⌨	A dialing tone is played. Dial the phone number of another subscriber.
📞	The new subscriber picks up the phone.
📞	Then, Hook-on, the call is transferred. Note: depending of the IBC setting, the transfer can also be done with R4 instead of on-hook.

2.1.4.6 Three-Way Conference

When a FXS subscriber has got two calls (one active, one on-hold) the FXS subscriber may decide to start a three-way conference. Three-way conference is started by pressing hook-flash and 3.

Making a Second Call and Starting 3-Way Conference

Actions / Events on Phone	Comments
☎ooo☎	One call is active
R	Press hook flash button.
⌨	A dialing tone is played. Dial the phone number of another subscriber.

☎ ring!	IBC attempts to connect the call with the new subscriber. The other subscriber's phone rings.
☎ ooo ☎	The new subscriber answers.
R 3	Press hook-flash, then 3.
	3-way conference is started.

2.1.5 Advanced Services with ISDN / SIP Phones

The same services can be offered on ISDN or SIP phones as those offered with FXS phones, as mentioned in the preceding section. Please consult the user manual of your ISDN or SIP phones for more details.

2.1.6 Dialing Features

2.1.6.1 Re-dial Last Calling Number

This feature enables a user to recall the last caller if the call was answered. If the call was not answered, the call is considered a missed call. In that latter case, please refer to: 2.1.6.4.

Redialing Last Calling Number

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 3	Dial `*53`. IBC spells the phone number of last calling number, and then the number is dialed.

Flushing Last Calling Number Information

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 3 * 0	Dial `*53*0`. IBC erases saved information about last calling number.
☎	Hang up.

Interrogating Last Calling Number

Actions / Events on Phone	Comments
☎	Off-hook the phone
* * 5 3	Dial `**53`. IBC spells the phone number of last calling number.
☎	Hang up.

2.1.6.2 Re-dial Last Called Number

This feature enables a user to recall the last called phone number.

Redialing Last Called

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 4	Dial `*54`. The last called number is dialed.

Flushing Last Called Information

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 4 * 0	Dial `*54*0`. IBC spells the number and erases saved information about last called number.
☎	Hang up.

Interrogating Last Called Number

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 5 4	Dial `**54`. IBC spells the phone number of last called number.
☎	Hang up.

2.1.6.3 Re-dial for Last Caller or Called

The next keypad redials the phone number of the last call (incoming or outgoing call). In other words, this service is the combination of redial service for last called/calling number.

Redialing Caller or Called of Last Call

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 2	Dial `*52`. The caller or called number of last call is dialed.

2.1.6.4 Re-dial for Missed Calls

A missed call is an incoming call that was not answered. The following keypads allow the user to recall the caller of the last missed call.

Redialing Caller of Last Missed Call

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 1	Dial **`*51`**. The caller number of the last missed call is dialed.

Flushing Caller Information of Last Missed Call

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 1 * 0	Dial **`*51*0`**. IBC spells the number and erases saved information about caller number of last missed call.
☎	Hang up.

Interrogating Last Called Number

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 5 1	Dial **`**51`**. IBC spells the phone number of caller of last missed call.
☎	Hang up.

Flushing Redial Information (Last Caller, Last called, Waiting CCBS)

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 0	Dial **`*50`**. IBC erases saved information about last caller, last called and waiting CCBS.
☎	Hang up.

2.1.6.5 Speed Dial (Directory service)

The directory service makes it possible to dial a full phone number with short dialing code. This feature is also known as directory service.

Making a Speed Dial

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 7 4 * ▦ ⇖ speed dial code	Dial **`*74*`**`<short number>` For example: **`*74*00`**. The call is initiated.

Adding a Number in Personal Directory

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 7 5 * 1 * ▦ ⇖ speed dial code * ▦ ⇖ full phone number	Dial **`*75*1*`**`<short number>`**`*`**`<full number>`
☎	Hook on. The number is saved.

Deleting a Number in Personal Directory

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 7 5 * 0 * ▦ ⇖ speed dial code	Dial **`*75*0*`**`<short number>` For example: dialing **`*75*0*11`** deletes the number whose short number is 11.
☎	Hang up.

Interrogating a Number in Personal Directory

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 7 5 * ▦ ↖ speed dial code	Dial `**75*<short number>` For example: dialing **`**75*12`** tells the full phone number whose short code is 12.
☎	Hang up.

If the user phone is auto-provisioned and has the proper faculty, the directory will be provided directly on the phone interface. This feature is available on the following phones:

- Thomson ST2022, ST2030
- Aastra 480i, 53i, 55i, 57i

2.1.7 Number Screening and Privacy

2.1.7.1 Hiding Calling Phone Number (CLIR)

The CLIR (Calling Line Identity Restriction) activation allows a user to tell the telephone network that his caller-id must not be displayed.

Activating CLIR

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 6 5 * 1	Dial **`*65*1`** and the caller-id is now hidden for any new call.
☎	Hang up.

De-Activating CLIR

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 6 5 * 0	Dial **`*65*0`** and the caller-id is now no more hidden for any new call.
☎	Hang up.

Interrogating CLIR Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 6 5	Dial **`**65`** and IBC tells what is the current CLIR activation status.
☎	Hang up.

Enabling CLIR Temporarily

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 6 6 * ▦ ⇖ Called Number	Dial **`*66*`**`<called number>` and IBC dials called number with CLIR active only for that call.
☎	Hang up.

2.1.7.2 Vocal Caller-Identity Presentation (CLIP)

The Vocal CLIP feature instructs IBC to tell the caller phone number in case of incoming call. Let us say that A calls B. B has enabled Vocal CLIP. B's phone rings. B hooks off; IBC spells the A phone number. This feature is useful for phones without display or for blind people.

Activating Vocal CLIP

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 3 * 1	Dial **`*33*1`** and the Vocal CLIP service is active.
☎	Hang up.

De-Activating Vocal CLIP

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 3 * 0	Dial **`*33*0`** and Vocal CLIP is de-activated.
☎	Hang up.

Interrogating Vocal CLIP Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 3 3	Dial **`**33`** and IBC tells what is the current vocal CLIP activation status.
☎	Hang up.

2.1.7.3 Hiding forwarder phone number

The Screened Forwarding activation allows a user to tell the telephone network that his caller-id in a forwarded call must not be displayed.

Let us say B has forwarded calls to C. When A calls B, the call is forwarded to C and C gets the caller (A) and the forwarder (B) numbers (default behavior – provided the phone set of C is able to display both numbers).

B can prevent the display of his called-id by activating screened forwarding. In that case, the string "anonymous" is displayed in the VIA field of the phone set of C and the corresponding vocal announcement is played if vocal CLIP is in force.

Activating Screened Forwarding

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 4 * 1	Dial `*34*1` and the forwarder number is now hidden for any new forwarded call.
☎	Hang up.

De-Activating Screened Forwarding

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 4 * 0	Dial `*34*0` and the forwarder number is now no more hidden.
☎	Hang up.

Interrogating Screened Forwarding Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 3 4	Dial `**34` and IBC tells what is the current Screened Forwarding status.
☎	Hang up.

2.1.7.4 Do Not Disturb (DND)

When the DND feature is active on a specific extension, it means that the called party does not wish to receive a call:

- If the user is called, the called party in DND mode is considered busy.
- If the phone is part of a hunt group, it is set temporarily out of the group.

Activating DND

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 9 * 1	Dial **`*29*1`** and the DND service is active.
☎	Hang up.

De-Activating DND

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 9 * 0	Dial **`*29*0`** and DND is de-activated.
☎	Hang up.

Interrogating DND Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 2 9	Dial **`**29`** and IBC tells what is the current DND activation status.
☎	Hang up.

2.1.7.5 Locking a Phone

It is possible to lock outgoing calls from a phone. To unlock, the user password must be entered within special dial-code.

Locking the Phone

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 7	Dial **`*17`** from the phone and the phone is locked.
☎	Hang up.

Unlocking the Phone

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 8 * ▦ ↖ User password	Dial **`*18*`**`<user-password>` from the phone and the phone is unlocked. (Default state)
☎	Hang up.

2.1.7.6 Phone status

This feature enables a user to get the phone status (free, busy, etc.) of another user.

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 3 2 * ▦ ↖ internal number	Dial **`**32*`**`<internal-number>` IBC spells the status of the user with the internal number.
☎	Hang up.

2.1.8 Entering / Exiting Hunt Group

A hunt group is a phone number that is not associated with a phone. The hunt group is associated with a set of phones. When the hunt group is called, the phones members of this group are called.

Entering a Hunt Group

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 1 * ▦ ⇖ hunt group number	Dial `*31*<hunt group phone number>` The phone enters the corresponding hunt group. The phone must be part of the hunt group to use this function.
☎	Hang up.

Exiting a Hunt Group

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 0 * ▦ ⇖ hunt group number	Dial `*30*<hunt group phone number>` The phone exits the hunt group. You cannot leave the hunt group if the phone is the last remaining member of the group.
☎	Hang up.

Entering all Hunt Groups

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 1	Dial `*31` and the phone enters all hunt groups.
☎	Hang up.

Exiting all Hunt Groups

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 0	Dial `*30` and the phone exits all hunt groups.
☎	Hang up.

2.1.9 Call Forwarding (CF)

Call Forwarding is a set of telephony services forwarding calls based on several criteria: called user not responding, busy, disconnected …

2.1.9.1 Disabling all Call Forwarding

As you will see in the next sections, there are several types of call forwarding. To disable all call forwards (except scheduled CFU), you can use the next command.

Actions / Events on Phone	Comments
	Off-hook the phone.
* 2 0	Dial **`*20`** and all possible call forwards (except scheduled CFU) are disabled.
	Hang up.

2.1.9.2 Call Forwarding Unconditional (CFU)

CFU is also called Call Forwarding Always (CFA). When this service is active, any received call is immediately forwarded to another number.

Activating CFU

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 8 * ⌨	Dial `*28*` and the phone number where the call must be forwarded to.
☎	Hang up.

Re-Activating CFU on the Last Programmed Number

Actions / Events on Phone	Comments
☎	Off-hook the phone
* 2 8	Dial `*28`. The CFU will be activated on the last CFU number.
☎	Hang up.

De-Activating CFU

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 8 * 0	Dial `*28*0` and CFU is de-activated.
☎	Hang up.

Interrogating CFU Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 2 8	Dial `**28` and IBC tells what is the current CFU activation status.
☎	Hang up.

2.1.9.3 Call Forwarding on No Reply (CFNR)

When this service is active on an extension, any received call is forwarded to another number, if the extension did not answer after several rings.

Activating CFNR

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 1 * ▦	Dial **`*21*`** and the phone number where the call must be forwarded to.
☎	Hang up.

Re-Activating CFNR on the Last Programmed Number

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 1	Dial **`*21`**. The CFNR will be activated on the last CFNR number.
☎	Hang up.

De-Activating CFNR

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 1 * 0	Dial **`*21*0`** and CFNR is de-activated.
☎	Hang up.

Interrogating CFNR Status

Actions / Events on Phone	Comments
☎	Off-hook the phone
* * 2 1	Dial **`**21`** and IBC tells what is the current CFNR activation status.
☎	Hang up.

2.1.9.4 Call Forwarding on Busy (CFB)

When this service is active on an extension, any received call is forwarded to another number, if the extension has got one call active.

Activating CFB

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 2 * ▦	Dial `*22*` and the phone number where the call must be forwarded to.
☎	Hang up.

Re-Activating CFB on the Last Programmed Number

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 2	Dial `*22`. The CFB will be activated on the last CFB number.
☎	Hang up.

De-Activating CFB

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 2 * 0	Dial `*22*0` and CFB is de-activated.
☎	Hang up.

Interrogating CFB Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 2 2	Dial `**22` and IBC tells what is the current CFB activation status.
☎	Hang up.

2.1.9.5 Simultaneous CFNR and CFB Activation

When this service is active on an extension, any received call is forwarded immediately to another number if the extension did not answer after several rings cannot be reached or has got one call active.

Activating CFNR and CFB

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 3 * ▦	Dial **`*23*`** and the phone number where the call must be forwarded to.
☎	Hang up.

Re-Activating CFNR and CFB on the Last Programmed Number

Actions / Events on Phone	Comments
☎	Off-hook the phone
* 2 3	Dial **`*23`**. The CFNR + CFB will be activated on the last CFNR + CFB number.
☎	Hang up.

De-Activating CFNR and CFB

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 3 * 0	Dial **`*23*0`** and CFNR + CFB is de-activated.
☎	Hang up.

Interrogating CFNR and CFB Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 2 3	Dial **`**23`** and IBC tells what is the current activation status.
☎	Hang up.

2.1.9.6 Call Forwarding on Disconnected (CFDI)

When this service is active on an extension, any received call is forwarded immediately to another number if the extension cannot be reached. CFDI is particularly useful for wireless SIP phones or dual-mode wireless phones because they can be temporarily unavailable quite often.

Activating CFDI

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 4 * ▦	Dial **`*24*`** and the phone number where the call must be forwarded to.
☎	Hang up.

Re-Activating CFDI on the Last Programmed Number

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 4	Dial **`*24`**. The CFDI will be activated on the last CFDI number.
☎	Hang up.

De-Activating CFDI

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 4 * 0	Dial **`*24*0`** and CFDI is de-activated.
☎	Hang up.

Interrogating CFDI Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 2 4	Dial **`**24`** and IBC tells what is the current CFDI activation status.
☎	Hang up.

2.1.9.7 Simultaneous CFDI and CFNR Activation

When this service is active on an extension, any received call is forwarded immediately to another number if the extension cannot be reached or does not reply.

Activating CFDI and CFNR

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 5 * ▦	Dial **`*25*`** and the phone number where the call must be forwarded to.
☎	Hang up.

Re-Activating CFDI and CFNR on the Last Programmed Number

Actions / Events on Phone	Comments
☎	Off-hook the phone
* 2 5	Dial **`*25`**. The CFDI + CFNR will be activated on the last CFDI + CFNR number.
☎	Hang up.

De-Activating CFDI and CFNR

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 5 * 0	Dial **`*25*0`** and CFDI + CFNR is de-activated.
☎	Hang up.

Interrogating CFDI and CFNR Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 2 5	Dial **`**25`** and IBC tells what is the current activation status.
☎	Hang up.

2.1.9.8 Simultaneous CFDI and CFB Activation

When this service is active on an extension, any received call is forwarded immediately to another number, if the extension cannot be reached or is busy.

Activating CFDI and CFB

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 6 * ▦	Dial **`*26*`** and the phone number where the call must be forwarded to.
☎	Hang up.

Re-Activating CFDI and CFB on the Last Programmed Number

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 6	Dial **`*26`**. The CFDI + CFB will be activated on the last CFDI + CFB number.
☎	Hang up.

De-Activating CFDI and CFB

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 6 * 0	Dial **`*26*0`** and CFDI + CFB is de-activated.
☎	Hang up.

Interrogating CFDI and CFB Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 2 6	Dial **`**26`** and IBC tells what is the current activation status.
☎	Hang up.

2.1.9.9 Simultaneous CFDI, CFNR and CFB Activation

When this service is active on an extension, any received call is forwarded immediately to another number if the extension cannot be reached or is busy or does not reply.

Activating CFDI, CFNR and CFB

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 7 * ▦	Dial `*27*` and the phone number where the call must be forwarded to.
☎	Hang up.

Re-Activating CFDI, CFNR and CFB on the Last Programmed Number

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 7	Dial `*27`. The CFDI, CFNR + CFB will be activated on the last CFDI, CFNR + CFB number.
☎	Hang up.

De-Activating CFDI, CFNR and CFB

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 2 7 * 0	Dial `*27*0` and CFDI, CFNR + CFB is de-activated.
☎	Hang up.

Interrogating CFDI, CFNR and CFB Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 2 7	Dial `**27` and IBC tells what is the current activation status.
☎	Hang up.

2.1.9.10 Scheduled CFU

A standard CFU (Call Forward Unconditional) is active permanently until explicitly de-activated. A scheduled CFU is a CFU that becomes active periodically. This function is useful to forward calls when the company is closed. Scheduled CFU is programmed by selecting the day. Day number 1 is Monday, 7 is Sunday. 0 indicates all days.

A special case of CFU can be used to forward incoming calls straight to the user's voicemail. For that type of transfer, the user needs to set the destination number to his keypad-profile "Voicemail" keypad. By default, for users without a set keypad-profile, or for hunting-groups, the keypad-profile 1 will be used.

Priorities and management of conflicts when several types of CFU:

- If the user attempts to configure a daily CFU whose time frame overlaps with the first daily CFU time frame, the system rejects the configuration request.
- Weekly CFU permits to configure four time frames where CFU is active every week. Overlapping time frames are rejected by the system.
- Weekly CFU overrides daily CFU and daily CFU overrides standard CFU.

Activating Scheduled CFU

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 7 2 8 * ▦ ⇖ forward-to number * ▦ ⇖ day + time-frame-id * ▦ ⇖ start hour * ▦ ⇖ end hour	Dial **`*728*`**`<number>`**`*`**`<day><time-id>`**`*`**`<hhmm>`**`*`**`<hhmm>`, where: • `day` is a number from 0 to 7 (0=all, 1=Monday…) • `time-id` is a number 1-4 (up to 4 time-frames per day are allowed) Examples: 1) Dialing `*728*0141877777*01*1900*2359` and `*728*0141877777*01*0000*0900` forwards every day all calls to 0141877777 from 19h00 to 23h59 and from 0h00 to 9h00. 2) Dialing `*728*0141877777*61*1200*2359` and `*728*0141877777*61*0000*0900` forwards every Saturday all calls to 0141877777 from 12h00 to 23h59 and from 0h00 to 9h00. 3) Dialing `*728*0141877777*71*0000*2359` forwards every Sunday all calls to 0141877777 from 00h00 to 23h59.
☎	Hang up.

Re-Activating Scheduled CFU

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 7 2 8 * 1 * ▦ ⇖ day + time-frame-id	Dial **`*728*1*`**`<day><time-frame-id>` The previously programmed scheduled CFU is activated again.
☎	Hang up.

De-Activating Scheduled CFU

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 7 2 8 * 0 * ⇖ day + time-frame-id	Dial `*728*0*<day>[<time-frame-id>]` The corresponding programmed scheduled CFU is de-activated. (Note: `*728*0*0` de-activates all scheduled CFU.)
☎	Hang up.

Querying Scheduled CFU

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 7 2 8 * ⇖ day + time-frame-id	Dial `**728*<day>[<time-frame-id>]` and IBC spells the activation status of a programmed scheduled CFU.
☎	Hang up.

2.1.9.11 Enabling/Disabling Multiple Call Forwarding

Let us say B has forwarded calls to C, C to D … When A calls B, the call is forwarded to C, then D … which is the default behavior. However it is possible to disable multiple call forwards.

Allowing Multiple Call Forwards

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 8 6 * 1	Dial **`*86*1`** and multiple call forwards are allowed.
☎	Hang up.

Disabling Multiple Call Forwards

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 8 6 * 0	Dial **`*86*0`** and multiple call forwards are disallowed.
☎	Hang up.

Querying Multiple Call Forwards Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 8 6	Dial **`**86`** and IBC tells multiple call forwards.
☎	Hang up.

2.1.9.12 Follow-Me

This service (also called "reach-me" service) is a feature that makes a mobile user more reachable: he may be reachable on his fixed line, but also on his mobile phone or in home office. The follow-me service instructs the IBC to try to reach the subscriber on a first extension (ex.: fixed line), then on 2nd number (his home office), then on a third one (mobile phone).

To setup such service with the interactive voice guide, you must call IVR from your fixed line; then, the IVR asks what first/second/third phone numbers should be used for follow-me service.

Otherwise, Follow-Me can be setup without voice guide; this second method is quicker to setup, but requires to dial a more complex pattern.

Setting Up Follow-Me Service with Interactive Voice Guide

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 8 5 * 2	Dial **`*85*2`**
⌨	The phone is connected with voice guide. IVR asks some questions. Press keys on the phone as appropriate to setup the follow-me service.

Setting Up Follow-Me Service with Interactive Voice Guide

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 8 5 * ⌨ ⬉ first number to call * ⌨ ⬉ second number to call * ⌨ ⬉ third number to call	Dial **`*85*`**`<number1>`**`*`**`<number2>`**`*`**`<number3>` First, the phone corresponding to called number rings. After a delay, IBC tries to reach `<number1>`, then `<number2>` if **`<number1>`** does not answer; then `<number3>`.
☎	Hang up.

Re-Activating Follow-Me with the Last Programmed Numbers

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 8 5	Dial **`*85*1`** and follow-me is active again.
☎	Hang up.

Disabling Follow-Me

Actions / Events on Phone	Comments
	Off-hook the phone.
* 8 5 * 0	Dial `*85*0` and follow-me is de-activated again.
	Hang up.

2.1.9.13 Retrieving a Forwarded Call

Calls forwarded to a mobile phone can be retrieved on the fixed line for convenience (better speech quality, hands free …).

Retrieving a Forwarded Call

Actions / Events on Phone	Comments
	Off-hook the phone that forwarded the call and where you wish to retrieve the call
* 4 2	Dial `*42`
	You are now connected with the forwarded call.

2.1.10 Manager / Secretary Filtering

This feature consists in forwarding all calls destined to the manager to the secretary. The manager just needs to configure an unconditional call forward to the secretary. The secretary may transfer the call to the manager. To facilitate secretary's decision to transfer the call, the secretary can program IBC so that it tells the manager status before receiving the forwarded call (example: <x> is busy, unavailable, available or in do-not-disturb mode).

Secretary Configuring Manager Status Announcement

Actions / Events on Phone	Comments
	Off-hook the phone.
* 3 3 * 1	At off-hook, IBC informs the secretary which phone number is calling (vocal CLIP) or
* 3 3 * 2	At off-hook, IBC informs the secretary which phone number is calling and who forwarded the call (phone number or name if available) or
* 3 3 * 3	At off-hook, IBC informs the secretary who forwarded the call or
* 3 3 * 4	At off-hook, IBC informs the secretary of the forwarder status (do not disturb, unavailable, available, busy) or
* 3 3 * 5	At off-hook, IBC informs the secretary of the forwarder status (do not disturb…), the forwarder number/name and the calling number.
* 3 3 * 0	This code de-activates vocal announcement at off-hook.
	Hang up.

If the secretary is away from office, he/she may disable call forwarding from manager, so that the manager receives the calls. This feature is called call forward rejection.

Rejecting Call Forwards

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 8 9 * 1	Dial **`*89*1`** and forwarded calls (from manager) are rejected.
☎	Hang up.

Accepting Call Forwards

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 8 9 * 0	Dial **`*89*0`** and forwarded calls are accepted (default behavior).
☎	Hang up.

Querying Call Forward Reject Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 8 9	Dial **`**89`** and IBC tells the call forward reject status.
☎	Hang up.

2.1.11 Call Waiting

When a subscriber has got one call in progress and a second call destined to that subscriber comes in, there are two cases:

- Call waiting is disabled: the second call is refused, because the called user is considered busy. The second call is then forwarded to voice mail or asked for automatic recall.
- Call waiting is enabled: the second caller hears the phone ringing. The called user will hear a call waiting tone (FXS phone) or see a second incoming call on the phone display (ISDN phone, SIP phone).

Activating Call Waiting

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 4 3 * 1	Dial **`*43*1`** and call waiting is enabled (default behavior).
☎	Hang up.

De-activating Call Waiting

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 4 3 * 0	Dial **`*43*0`** and call waiting is disabled.
☎	Hang up.

Querying Call Waiting Activation Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 4 3	Dial **`**43`** and IBC tells call waiting activation status.
☎	Hang up.

2.1.12 Voice Mail

To access the voice mail, the user password must be provided (it is the phone main internal number by default). The user password can be changed by dialing a special phone number from user's phone.

Changing User Password

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 4 * ▦ ↖ old password * ▦ ↖ new password	Dial `*14*<old-user-passwordd>*<new-user-password>` then listen to instructions to confirm password change.
☎	Hang up.

Querying and Configuring Voice Mail

Actions / Events on Phone	Comments
☎	Off-hook the phone.
8 8 8	Dial **888** and you are connected with a voice guide to use and configure the voice mail. From the voice menu, you can: • Listen to your voice mails. • Record voice mail greeting. • Configure your voice mail as a simple answering machine (only a voice message is played, but no voice mail can be recorded).

Leaving a Voice Mail

Actions / Events on Phone	Comments
☎	Off-hook the phone.
8 8 8 *	Dial **888*** and you are connected with a voice guide to leave the voice mail. From the voice menu, you can: • Record your voice mail. • Listen to your recorded voice mail. • Modify your voice mail if needed.

In case of call forwards, IBC behavior can be set such that voicemail of the first called or the last called is used. For example: A calls B. B forwarded its calls to C. C is busy. In that case, A must be connected to the voice mail of B (first called) or C (last called).

Setting Voice Mail of Last User in Case of Call Forwards

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 8 4 * 1	Dial `*84*1` and voice mail of last called user will be contacted.
☎	Hang up.

Setting Voice Mail of First User in Case of Call Forwards

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 8 4 * 0	Dial `*84*0` and voice mail of first called user will be contacted. (Default behavior).
☎	Hang up.

Querying Voice Mail Position

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 8 4	Dial `**84` and IBC tells forward to last voice mail activation status.
☎	Hang up.

2.1.13 Call Completion on Busy Subscriber (CCBS – Automatic Recall -)

CCBS is a service invoked as an ultimate step before forwarding a call to user voice mail if the called party is busy. Before asking if the calling user wants to leave a message in voice mail box, the caller is prompted to enter a digit to confirm he would like to be recalled. CCBS works when caller and called are internal subscribers.

Let us say A calls B and B is busy. A can activate automatic recall. When B is no longer busy, A is called and A must pick up the phone within 30 seconds. Then, B is called. If A hooks on before B picks up, CCBS is deactivated.

Enabling CCBS

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 5 * 1	Dial **`*55*1`** and automatic recall will be offered when this phone is called while being busy.
☎	Hang up.

Disabling CCBS

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 5 * 0	Dial **`*55*0`** and automatic recall will not be offered when this phone is called while being busy.
☎	Hang up.

Interrogating CCBS Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 5 5	Dial **`**55`** and IBC tells whether CCBS is enabled or not.
☎	Hang up.

Deleting Waiting CCBS

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 5 6	Somebody called this phone and requested an automatic recall. Dial **`*56`** and automatic recall is cancelled.
☎	Hang up.

Asking Waiting CCBS

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 5 6	Dial **`**56`** and IBC tells if an automatic recall is pending.
☎	Hang up.

2.1.14 Overflow phone

An overflow phone can be set. This phone is called before cancelling a call when there is no answer and no voicemail or no call forwarding is programmed.

Setting an overflow phone

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 6 * ▦ ↖ Overflow phone number	Dial **`*36*`** and the overflow phone extension.
☎	Hang up.

Disabling Overflow phone

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 6 * 0	Dial **`*36*0`** and overflow is de-activated.
☎	Hang up.

Re-Enabling an overflow phone

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 6 * 1	Dial **`*36*1`**.
☎	Hang up.

Interrogating Overflow phone status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 3 6	Dial **`**36`** and IBC tells overflow activation status.
☎	Hang up.

2.1.15 Ringback Message

Instead of using the standard ring-back tone, a calling user (internal or external) can hear a sound file (music or vocal announcement). One music file is supported per called phone number.

The ringback message can be recorded by calling a special phone number, which connects to a recording Interactive Voice Responder (IVR).

Enabling Ringback Message

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 5 * 1	Dial **`*35*1`** and the ringback message is active.
☎	Hang up.

Disabling Ringback Message

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 5 * 0	Dial **`*35*0`** and the ringback message is de-activated.
☎	Hang up.

Interrogating Ringback Message

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 3 5	Dial **`**35`** and IBC tells ringback message activation status.
☎	Hang up.

Recording Ringback Message

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 5 * 2	Dial **`*35*2`**
☎ooo☎	You are connected to a voice guide to record a ringback message

2.1.16 Call Pickup

Call pickup is a service allowing an authorized user to intercept a call destined to another subscriber. The call-pickup feature functions as follows: A calls B, C hears B's phone ringing. C off-hooks his phone and dials a specific dial pattern. As a result of call pickup feature, A is connected to C (instead of B; B's phone is no more ringing). Call-pickup is enabled by default.

Activating Call Pickup

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 4 1	Dial `*41` and call pickup is enabled (default behavior).
☎	Hang up.

De-activating Call Pickup

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 4 0	Dial `*40` and call pickup is disabled.
☎	Hang up.

Querying Call Pickup Activation Status

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 4 1	Dial `**41` and IBC tells call pickup activation status.
☎	Hang up.

Picking up a Call

Actions / Events on Phone	Comments
☎	Another phone is ringing. Off-hook the phone.
* 4 4 * ⌨ ↖ ringing phone number to pickup	Dial `*44*` + the phone number of the ringing phone.
☎○○○☎	If call pickup is authorized on that phone, call is connected.

Picking Up a Call from a phone of one of my groups

Actions / Events on Phone	Comments
☎	Another phone of one of my groups is ringing. Off-hook the phone.
* 4 4	Dial ***44**
☎ ○○○ ☎	If call pickup is authorized on that phone, call is connected.

2.1.17 Vocal messages

2.1.17.1 Listening messages

Listening IVR messages

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 8 * 0 * ▦ ↖ IVR ID ▦ ↖ IVR message path	Dial **`*38*0*`**`<IVR-id><message path>`
☎ooo☎	Listen to the selected message.

Listening ringback message

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 8 * 1	Dial **`*38*1`**
☎ooo☎	Listen to the ringback message.

Listening trunk message

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 8 * 2 * ▦ ↖ administrator password ▦ ↖ trunk ID	Dial **`*38*2*`**`<IBC-admin-password><trunk-ID>`
☎ooo☎	Listen to the trunk message.

Listening music on hold

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 8 * 3 * ▦ ↖ administrator password	Dial ***38*3***`<IBC-admin-password>`
☎ ooo ☎	Listen to the music on hold.

2.1.17.2 Recording IVR messages

IVR messages can be recorded using the IVR itself (see 2.1.20). It is also possible to record specific IVR messages using the keypad. First, record the message as follows.

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 9 * 0 * ▦ ↖ IVR ID ▦ ↖ IVR message path	Dial ***39*0***`<IVR-id><message path>`
☎ ooo ☎	You are connected to a voice guide to record the selected IVR message.

Then, tell to IVR to take into account the newly recorded message as follows.

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 3 9 * 0 * ▦ ↖ IVR ID	Dial ****39*0***`<IVR-id>`
☎	Hang up.

2.1.18 Phone Installation

Phone installation can be automatic or done via the web configuration interface with IBC administrator access, command line interface (CLI) or keypad. Phone installation is a function reserved to IBC administrators. By default, the IBC administrator password is 0000.

This section deals with phone installation per keypad. In case of FXS, it assumes that the IBC router has a start configuration compatible with this mode (standard OneAccess factory settings). In case of SIP phones, it is assumed that either the SIP phone is recognized by IBC router auto-installation or the SIP phone is already configured such that a call from this SIP phone is possible.

2.1.18.1 Adding / Removing Phone Numbers

2.1.18.1.1 Adding a Private Phone Number

The next keypad configures the phone as a phone with an internal phone number only. If the phone number already exists in the system and if it is associated with a SIP phone, the old MAC address associated with this phone is replaced by the new MAC address.

Phone Installation with Internal Number Only

Actions / Events on Phone	Comments
☎	Off-hook the SIP phone you want to install.
* * 1 * ▦ ↖ administrator password * ▦ ↖ internal number	Dial `**1*<IBC-admin-password>*<internal-number>` The number should be installed.
☎	Hang up.

Phone Installation with Internal Number Only and Using an Installation Profile

Actions / Events on Phone	Comments
☎	Off-hook the SIP phone you want to install.
* * 1 ▦ ↖ installation profile ID (one digit) * ▦ ↖ administrator password * ▦ ↖ internal number	Dial `**1<profile-id>*<IBC-admin-password>*<internal-number>` The number should be installed with the specified installation profile.
☎	Hang up.

2.1.18.1.2 *Assigning a Public Phone Number to a Phone*

Adding a public phone number also adds implicitly a private (internal) phone number; the internal phone number is derived by taking the last digits. If the phone number already exists in the system and if it is associated with a SIP phone, the old MAC address associated with this phone is replaced by the new MAC address.

External Number Installation without Entering the Internal Number

Actions / Events on Phone	Comments
☎	Off-hook the phone that you want to install the phone number on.
* * 2 * ▦ ↖ administrator password * ▦ ↖ external number	Dial `**2[<profile-id>]*<IBC-admin-password>*<external-number>` The number should be installed.
☎	Hang up.

External and Internal Number Installation

Actions / Events on Phone	Comments
☎	Off-hook the phone that you want to install the phone number on.

* * 2
* ▦ ↖ administrator password
* ▦ ↖ external number
* ▦ ↖ internal number
	Dial `**2[<profile-id>]*<IBC-admin-password>`
	`*<external-number>`
	`*<internal-number>`
	The number should be installed.

☎	Hang up.

2.1.18.1.3 Uninstalling a Phone Number

Uninstalling a phone number fails if the phone number is attached to a phone:

Phone Number Uninstalling from any Phone

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 0 * ▦ ↖ administrator password * ▦ ↖ internal number	Dial `**0*<IBC-admin-password>*<internal-number>` The number should be uninstalled.
☎	Hang up.

Phone Number uninstalling from the Phone to be uninstalled

Actions / Events on Phone	Comments
☎	Off-hook the phone that you want to uninstall.
* * 0 * ▦ ↖ administrator password	Dial `**0*<IBC-admin-password>` The number associated with this phone should be uninstalled.
☎	Hang up.

2.1.18.2 Login

When some users move around offices, it is possible to reassign a phone number to another phone. In order to do this, the user must enter a special dial-code to log in. Then, any inbound call destined to the user is sent to the phone where the user logged in.

- In the "permanent login" mode, the older number on the new phone cannot be used any more. The calling number for outbound calls is the new phone number and only the new phone number can be called. Phones to be installed are configured with a default phone number. The permanent login function allows installing the real number on such phones.

Note that only one permanent login is possible per user. A permanent login on a new phone cancels the former permanent login on another phone.

- In the "wired login" mode, the user logs on a given phone. When a call is destined to that user, both phones ring (as if they were FXS phones on the same wire). If you call from one of these phones, the caller is the logged user. The phone number where the user logged in can still be called.
- In the "dual mode login" mode, the behavior is the same as the wired login. The only difference is: when the phone where the login was done is disconnected, the phone number is considered as disconnected. For convenience, the dual mode login can be temporarily suspended then restored.
  - Example: Phone A is a fixed line phone number.
  - Phone B is a WiFi phone.
  - The user logs phone A number on the WiFi phone.
  - When A is called and the WiFi phone is connected, the fixed and WiFi lines ring.
  - When A is called and the WiFi phone is disconnected, the fixed and WiFi lines do not ring (call is processed via the Call Forward on Disconnected – CFDI – to a GSM/3G phone for example).

Note that there can be only one login either permanent or wired or dual per phone. A new such login on the phone cancels the former permanent or wired or dual login on the same phone.

- It is also possible to do a "one-call login": this mode enables to place one call from any phone using the user phone number as caller-id.
- It is also possible to do a "shared line login": this mode enables receiving the calls on all the logged phones but not to place calls using the user phone number as caller-id.
- It is also possible to do a "simultaneous ring login": this mode enables receiving the calls also on an indicated external phone. Another call is made to the external call. This feature can only be activated using `ibc-user-configuration/number` CLI commands (or the web interface).

Permanent Login

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 1 1 * ▦ ⇖ internal number * ▦ ⇖user password	Dial `*111*<internal-number>*<user-password>` The user password is the one that corresponds to the internal number (not the IBC administrator password).
☎	Hang up.

Wired Login

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 1 2 * ▦ ↖ internal number * ▦ ↖ user password	Dial `*112*<internal-number>*<user-password>` The user password is the one that corresponds to the internal number (not the IBC administrator password).
☎	Hang up.

Dual Mode Login

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 1 3 * ▦ ↖ internal number * ▦ ↖ user password	Dial `*113*<internal-number>*<user-password>` The user password is the one that corresponds to the internal number (not the IBC administrator password).
☎	Hang up.

Permanent / Wired / Dual Mode Logout

Actions / Events on Phone	Comments
☎	Off-hook the phone where you logged on.
* 1 1 0	Dial `*110`
☎	Hang up.

One Call Login

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 1 5 * ▦ ↖ internal number * ▦ ↖ user password * ▦ ↖ called number	Dial `*115*<internal-number>*<user-password>*<number>` The user password is the one that corresponds to the internal number (not the IBC administrator password).
☎	Hang up.

Shared Line Login

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 2 1 * ▦ ↖ internal number * ▦ ↖ user password	Dial `*121*<internal-number>*<user-password>` The user password is the one that corresponds to the internal number (not the IBC administrator password).
☎	Hang up.

Shared Line Logout

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 2 0 * ▦ ↖ internal number	Dial `*120*<internal-number>`
☎	Hang up.

Suspend dual mode login

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 1 6 * 0	Dial **`*116*0`** on your phone, dual mode login is temporarily removed.
☎	Hang up.

Restore dual mode login

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 1 6 * 1	Dial **`*116*1`** on your phone, dual mode login is restored.
☎	Hang up.

Ask for all logins

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 1 0 0	Dial **`**100`** on your phone, IBC spells all your logins on any phone.
☎	Hang up.

Reset all logins

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 0 0	Dial **`*100`** on your phone, all your logins on any phone are removed.
☎	Hang up.

Ask for all user logins

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* * 1 0	Dial `**10` on your phone, IBC spells all user logins on the phone.
☎	Hang up.

All users logout

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 1 0	Dial `*10` on your phone, all user logins on the phone are removed.
☎	Hang up.

2.1.18.3 Setting Language

The user can choose his personal language for voice prompts played by IBC (voice mail …). The language is identified by a number: 1 (fr), 2 (en) …

Setting Language

Actions / Events on Phone	Comments
☎	Off-hook the personal phone.
* 9 ▦ ↖ language number (1 digit)	Dial `*9<language>`
☎	Hang up.

Asking Current Language

Actions / Events on Phone	Comments
☎	Off-hook the personal phone.
* * 9	Dial `**9` and IBC tells the current language.
☎	Hang up.

2.1.19 Direct Inward System Access (DISA)

DISA is a service that must be activated in the system. A public phone number is allocated to DISA service. An external caller can call this public phone number and will be then connected to (or logged in) IBC DISA. The user must then enter its (internal) phone number and PIN code (user password). From there, the user can enter any digit sequence as if he was dialing from his internal phone. The user can do the following operations, provided that they are authorized in system configuration:

- Call an internal/external user: the called party will not see the external phone as the caller number. Instead, the called party sees the caller as if it was really calling from its office phone.
- Query voice mail.
- Configure or query the status of voice services by entering a keypad.

Benefits of DISA:

- One can call the DISA number and get charged for a local call (flat rate service in some countries). Any called number from DISA causes the company to be charged directly for long-distance/abroad/mobile calls.
- You can query voice mail and set up call forwards for example from anywhere.

Using DISA

Actions / Events on Phone	Comments
📞	Off-hook from an external phone.
⌨	Dial the DISA public phone number. Ask your administrator to get this number.
☎ooo☎	You are now connected to DISA. A message is played to invite you to dial your private extension number.
⌨	Dial your extension number (internal number).
☎ooo☎	A message is played to invite you to dial your PIN code (user password).
⌨	Dial your PIN code (user password).
⌨	Dial any digit sequence as if you were calling from your office phone. Example: • **`888`** to query voice mail • **`*28*`**`<number>` to program an unconditional call forward • 004912345678 to call an external number in Germany for example

2.1.20 Interactive Voice Responder (IVR) Configuration

2.1.20.1 Entering IVR Configuration

An IVR (Interactive voice responder) turns IBC into a vocal server. For example, when dialing 0141877000, a caller will be connected immediately to the IVR. The IVR plays a message such as: "Welcome to XYZ Company! Enter 1 for sales department, 2 for technical hotline, 0 for an operator". If the user presses 2, a voice sub-menu can be played or the call is forwarded to the hotline hunt group (multiple phones may ring). An IVR script can play only one message.

Several IVR can have been declared by CLI or web. The IVR are designated by an ID ranging from 0 to 9. The exact role of every IVR must be defined externally. For example, a second IVR script could announce the following message "Welcome to XYZ Company! We are open from 9 a.m. to 19 p.m. from Monday to Friday. Please call us again during open hours". Call Forward Unconditional can be programmed from one IVR to the other during closed hours.

Up to 2 phone numbers are declared as administration phones. Calling from one of these phones allows changing the content of IVR by following the next steps:

Actions / Events on Phone	Comments
☎	Off-hook the phone.
* 3 7 * ▦ ⇖ IVR ID	Dial **`*37*1`** for configuration for IVR 1. Then a voice guide asks some question; press telephone keys and record voice messages as appropriate.

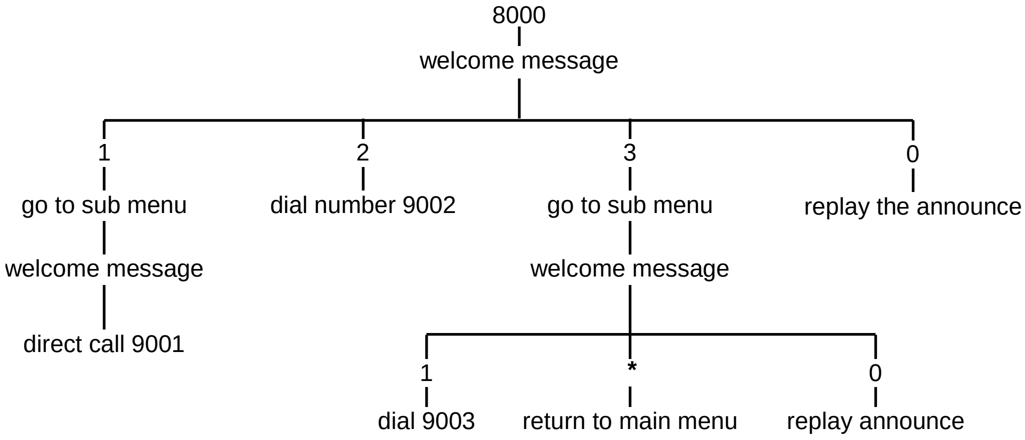
2.1.20.2 Keypad Commands

The next table defines the keypad commands for IVR configuration.

Main menu	
Play the welcome announcement	**1**
Record the welcome announcement	**2**
Add a direct call after announcement	**3**
Delete direct call	**4**
Ask for direct call status	**5**
Remove IVR	**9**
Replay help message	**0**
Associate an action with a key (for example, you can attach the button 1 with the action of going to a sub-menu). Then you are prompted to enter the action defined below.	**6**
Configuration menu: key association with an action	
Associate a call	**1**
Associate a return to previous menu	**2**
Associate a sub menu	**3**
Associate a repetition	**4**
Deactivate button	**9**
Replay help message	**0**
Change button	*****
Return to main menu	**#**

2.1.20.3 Example

The example shows how to build a vocal server with 2 levels. Here is the graph of a possible utilization:



First, a phone number is declared as admin phone number of the IVR (receptionist):

```
ibc-user-configuration
  receptionist 1
    admin-phone 9000
    exit all
```

Conventions: Black text is for actions carried out by the user. Grayed text is for messages played by IBC.

Enter the configuration menu **`*37*1`**.

Listen to “Configuration menu for voice server number 1. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 2 to record a message.

Listen to “Dictate your message after the tone, then press pound.”

Record your message and terminate by #.

Listen to “Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 6 to associate an action with a button.

Listen to “Please select the button.”

Press 0 to associate an action with.

Listen to “No action is associated with this button. Press one to configure a call number, three to associate a sub-menu, four to repeat the message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again.”

Press 4 to associate a announce repetition with button 0.

> Listen to “Operation successful. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 6 to associate an action with a button.

> Listen to “Please select the button.”

Press 1 to associate an action with.

> Listen to “No action is associated with this button. Press one to configure a call number, three to associate a sub-menu, four to repeat the message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again.”

Press 3 to associate a sub menu to button 1.

> Listen to “Operation successful. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 6 to associate an action with a button.

> Listen to “Please select the button.”

Press 1 to select the new sub menu.

> Listen to “This button provides access to a sub-menu. Press one to go to the sub-menu, two to change the action, three to come back to the main menu, otherwise press zero to hear this message again.”

Press 1 to enter the sub menu configuration.

> Listen to “Configuration menu for voice server number 1, 1. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 2 to record a message.

> Listen to “Dictate your message after the tone, then press pound.”

Record your message and terminate by #.

> Listen to “Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 3 to configure a direct call.

> Listen to “Please enter the number to call.”

Press 9001 as number to call.

> Listen to “Operation successful."

Hang up to exit the sub menu configuration and enter the configuration menu again **`*37*1`**.

Listen to “Configuration menu for voice server number 1. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 6 to associate an action with a button

Listen to “Please select the button.”

Press 2 to associate an action with.

Listen to “No action is associated with this button. Press one to configure a call number, three to associate a sub-menu, four to repeat the message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again.”

Press 1 to configure a direct call.

Listen to “Please enter the number to call.”

Press 9002 as number to call.

Listen to “Operation successful. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 6 to associate an action with a button.

Listen to “Please select the button.”

Press 3 to associate an action with.

Listen to “No action is associated with this button. Press one to configure a call number, three to associate a sub-menu, four to repeat the message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again.”

Press 3 to associate a sub menu to button 3.

Listen to “Operation successful. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again."

Press 6 to associate an action with a button.

Listen to “Please select the button.”

Press 3 to select the new sub menu.

Listen to “This button provides access to a sub-menu. Press one to go to the sub-menu, two to change the action, three to come back to the main menu, otherwise press zero to hear this message again.”

Press 1 to enter the sub menu configuration.

Listen to “Configuration menu for voice server number 1, 3. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 2 to record a message.

Listen to “Dictate your message after the tone, then press pound.”

Record your message and terminate by #.

Listen to “Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 6 to associate an action with a button.

Listen to “Please select the button.”

Press 1 to associate an action with.

Listen to “No action is associated with this button. Press one to associate a transfer, two to associate a return to main menu, three to associate a sub-menu, four to associate a repeat message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again.”

Press 1 to configure a call.

Listen to “Please enter the number to call.”

Press 9003 as number to call.

Listen to “Operation successful. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 6 to associate an action with a button.

Listen to “Please select the button.”

Press * to associate an action with.

Listen to “No action is associated with this button. Press one to associate a transfer, two to associate a return to main menu, three to associate a sub-menu, four to associate a repeat message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again.”

Press 2 to associate a return to the main menu.

Listen to “Operation successful. Press one to listen to the message, two to record a message, three to configure an immediate call after the message, four to disable the immediate call, five to know the status of the immediate call, six to associate an action with a button, otherwise press zero to hear this message again.”

Press 6 to associate an action with a button.

Listen to “Please select the button.”

Press 0 to associate an action with.

Listen to “No action is associated with this button. Press one to associate a transfer, two to associate a return to main menu, three to associate a sub-menu, four to associate a repeat message, nine to deactivate this button, star to configure another button, pound to come back to the main menu, otherwise press zero to hear this message again.”

Press 4 to associate an announce repetition.

Listen to “Operation successful."

Hang up and dial 8000 to test your new vocal server.

2.2 USER'S GUIDE WITH CLI COMMANDS

This section deals with voice supplementary services activation / de-activation and configuration. The configuration status of every voice service is kept in an internal database. The following processes (i.e. configuration interface) allow changing service configuration on that database: per CLI, per interactive voice guide or per web interface (not always available). This section focuses only on CLI.

All services in this section can be configured by phone. They are saved automatically in IBC database, so that no `save running-config` command is needed.

To start configuring such services, go into IBC user number configuration mode:

```
CLI> ibc-user-configuration
CLI(ibc-user-configuration)> number { <name> | <main-number> }
CLI(ibc-user-configuration-number)>
```

Note: for readability in the following:

- The prompt `ibc-user-configuration` is abbreviated `ibc-user-config`.
- The prompt `ibc-user-configuration-number` is abbreviated `ibc-number`.

To display the current configuration for this number, enter the command:

```
CLI(ibc-number)> display
number 9000
  no scheduled cfu
  no cfu
  no cfb
  no cfd
  no cfnr
  pickup enabled
  dnd disabled
  call waiting enabled
  forwarded call accepted
  forward to first user's voicemail
  ccbs enabled
  ringing timeout 15
  off hook annoucement disabled
  no ringback message recorded
  outgoing calls enabled
  screened forwarder enabled
  clir disabled
  clip std
  no waiting ccbs
  no follow-me
  no permanent, wireline or dualphone login currently
  no temporary login currently
  no permanent login anywhere
  no temporary login anywhere
  no wireline login anywhere
  no dualphone login anywhere
  dualphone login enabled
  no simultaneous ring
  second forwarding enabled
  international number displayed format plus
  no directory
  no voicemail
CLI(ibc-number)>
```

2.2.1 Users login

2.2.1.1 Setting up a Permanent Phone

The Permanent Phone login function enables receiving and placing calls only on the new logged phone (using the user main phone number as caller-id). Refer to 2.1.18.2 for more information.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number <main-number>
CLI(ibc-number)> login <internal-number>
```

Use the `logout` command to remove the permanent phone login (see 2.2.1.4).

2.2.1.2 Setting up a Wired Phone

The Wired Phone login function enables receiving and placing calls on all the logged phones (using the user main phone number as caller-id). Refer to 2.1.18.2 for more information.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number <main-number>
CLI(ibc-number)> login-as-wirelinephone <internal-number>
```

Use the `logout` command to remove the wired phone login (see 2.2.1.4).

2.2.1.3 Setting up a Dual-Phone

For more general information about dual-phone principles, please refer to 3.1.1.4 and 2.1.18.2.

First, create two numbers associated with a fixed line and a mobile (WiFi) phone. Then, go under the mobile phone user configuration and log on the number of the fixed line. From there, the mobile phone rings simultaneously with the fixed line.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number <fixed-phone>
CLI(ibc-number)> login-as-dualphone <main-number-fixed-line>
```

You need to configure the CFDI, so that all calls are forwarded to GSM/3G network, when the mobile is not registered (e.g. switched off):

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <mobile-name> | <mobile-main-number> }
CLI(ibc-number)> cfd <GSM/3G-number>
```

Example: the internal phone number of a land line is 9000. An internal mobile phone number (over WiFi) is 9901 and the external number of the GSM/3G mobile phone is 0612345678. We want this cell phone to receive calls from fixed line when the mobile phone is actually connected via WiFi. Otherwise (mobile phone on disconnected state), the call is forwarded to the cell phone number (0612345678).

```
configure terminal
 ibc-service
  numbering-plan
  index 1
   main-number 9000
   voicemail external 0608080808 voicemail-id 0612345678
   name Fixed_Line
   exit
  index 2
   main-number 9901
   no voicemail
   name Mobile
   exit
  exit
 exit
ibc-user-configuration
```

```
number 9000
 cfd 0612345678
 login-as-dualphone 9901
 exit
exit
```

This function can be temporarily de-activated (for example in case the mobile phone is not available):

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> dualphone-login disabled
```

It can be re-activated (with previous parameters configuration):

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> dualphone-login enabled
```

Use the `logout` command to remove the dual phone login (see 2.2.1.4).

2.2.1.4 Removing Permanent, Wired, Dual Phones

Only one Permanent, Wired or Dual phone setting is possible on a phone. To remove such login:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number <main-number>
CLI(ibc-number)> logout <internal-number>
```

2.2.1.5 Setting-up a Shared Line

The Shared Line function enables receiving the calls on all the logged phones but not to place calls using the user phone number as caller-id.

To log (temporarily) on another internal phone to receive also the calls on that phone (all logged numbers ring simultaneously):

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> rcv-login <other-internal-number>
```

To stop receiving the calls on the other internal phone:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> rcv-logout <other-internal-number>
```

2.2.1.6 Simultaneous Ringing

The Simultaneous Ringing function is used to ring another external phone on each incoming call, in addition to the normal phone. It is similar to the force-ringing function on a trunk configuration (see 3.1.3.3). Command:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> login-simultaneous-ring <external-number>
```

`external-number` is the number of the phone you wish to ring in addition to your actual phone. This number must be an external one.

To suppress the simultaneous ringing function:

```
CLI(ibc-number)> no login-simultaneous-ring
```

2.2.1.7 Removing all logins of a user

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> reset-login
```

2.2.1.8 Removing all users logged on a phone

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> logout-all
```

2.2.2 Services for Incoming Calls

The following services are for users receiving a call.

2.2.2.1 Ringback Message

Calls coming from a trunk can be connected immediately. A ringback message such as "Wait, we are trying to reach the called party" is played while IBC is trying to reach the called party. The ringback message can be configured on a per-user basis. In case, the called user configured its own ringback message, the user ringback message is played. By default the feature is disabled:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> ring-back-message { enabled | disabled }
```

2.2.2.2 Vocal Announcements (for Manager/Assistant Filtering)

In case of manager / assistant filtering, the manager forwards his call to his assistant. For efficiency, the assistant could be willing to be informed before calling the manager about:

- Caller phone number (parameter `caller`): upon off-hook, the phone number of the caller is spelled by IBC. This feature is useful for telephone without display, because the calling number cannot be displayed.
- Forwarder (parameter `caller-forwarder`): in case a secretary gets calls for various managers, it is desired to know who the called manager was originally.
- Forwarder state (parameter `forwarder-state`): the forwarder and the status of forwarder (manager) are announced: if the manager has got one active call, the manager is said to be busy. If the manager has DND active, the manager is said to be occupied.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> off-hook-announcement { caller | caller-forwarder
      | forwarder | forwarder-state | caller-forwarder-state | disable }
```

2.2.2.3 Forwarder Screening

A user who utilizes call forwards can prevent IBC from announcing his number to the recipient (if this one uses off hook announcement of forwarder).

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> screened-forwarder { enabled | disabled }
```

2.2.2.4 Call Waiting

If one call is already active on a phone, by default, a second call destined to that phone is anyway sent by the IBC to the phone. In this case, the phone indicates that a call is waiting (special beep on FXS, LED or alarm message on LCD display for ISDN or SIP phones).

It is possible to forbid the call waiting feature. If a call is destined to a phone with disabled call waiting, the called party is considered by IBC as busy and the call is processed normally for a busy subscriber (for example, forward to voice mail).

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> call-waiting { enabled | disabled }
```

2.2.2.5 Call Completion on Busy Subscriber

CCBS is a service invoked as an ultimate step before forwarding a call to user voice mail if the called party is busy. Before asking if the calling user wants to leave a message in voice mail box, the caller is prompted to enter a digit to confirm he would like to be called. CCBS works when caller and called are internal subscribers.

Let us say A calls B and B is busy. A can activate automatic recall. A timer scans every minute if B is no longer busy. When B is no longer busy, A is called and he must pick up the phone within 30 seconds. IBC attempts to call A every minute. Then B is called. If A hooks on before B picks up, CCBS is cancelled. If B goes in DND mode or is no more reachable, CCBS is deactivated.

CCBS is active by default but can be disabled.

Restrictions:

- A and B are both internal.
- If C calls B while B is still busy and if A has already requested CCBS to recall, the CCBS service is not offered to C.
- A is called because B is not busy. A picks up the phone but B placed another call in the meantime (so it is busy again), then A is directed to voice mail.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> ccbs { enabled | disabled }
```

When an automatic recall is pending on the called number (B in the example), it is possible to cancel it.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> no waiting-ccbs
```

2.2.2.6 Call Forwarding

Call Forwarding is a service connecting automatically incoming call to another number. There are several types of call forward:

- Call Forward Unconditional (CFU): the call is forwarded immediately to the configured extension. For example, during holiday, one can transfer a fixed line number to a mobile phone.
- Call Forward on Busy (CFB): if the extension is in busy state, the call is immediately forwarded to the configured extension.
- Call Forward on No Reply (CFNR): the called phone rings for a certain time period without being answered; then the call is forwarded.

To configure the call forward:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
```

To activate / de-activate CFU (default: `no cfu`):

```
CLI(ibc-number)> cfu <forwarded-to nbr>
CLI(ibc-number)> no cfu
```

To re-activate CFU (CFU must have been programmed previously):

```
CLI(ibc-number)> cfu
```

N.B.: CFU can be applied on a hunt group or an internal service (not CFNR/CFB).

To activate / de-activate CFB (default: `no cfb`):

```
CLI(ibc-number)> cfb <forwarded-to nbr>
CLI(ibc-number)> no cfb
```

To activate / de-activate CFNR (default: `no cfnr`, timer = 15 sec):

```
CLI(ibc-number)> cfnr <forwarded-to nbr> [timer <timer>]
CLI(ibc-number)> no cfnr
```

To activate / de-activate CFDI (default: `no cfdi`):

```
CLI(ibc-number)> cfd <forwarded-to nbr>
CLI(ibc-number)> no cfd
```

Scheduled CFU on a daily / weekly basis is possible. If follow-me, CFU and scheduled CFU are configured, scheduled CFU has the greatest priority.

```
CLI(ibc-number)> scheduled-cfu <day-id> <schedule-id> <hh1:mm1> <hh2:mm2>
                                                       <forwarded-to-nbr>
```

Where `day-id` is the day where the scheduled CFU is active (i.e.: Monday, Tuesday ... Sunday or all). `Schedule-id` is the identifier of scheduled CFU time frame. `Hh1:mm1` is the start-time and `hh2:mm2` is the end time. Time frames must not overlap.

To suppress a scheduled CFU:

```
CLI(ibc-number)> no scheduled-cfu <day-id> <schedule-id>
```

To reactivate one of the last programmed scheduled CFU:

```
CLI(ibc-number)> scheduled-cfu <day-id> <schedule-id>
```

One can configure a phone to reject forwarded calls. For example, A calls B. B has forwarded calls to C. C may refuse to receive such a forwarded call (default: accept forwarded calls):

```
CLI(ibc-number)> [no] forwarded-call
```

A series of call forwards can also happen; that is: A calls B forwarding call to C forwarding call to D... Although OneOS detects loops in call forwards, it might be desired to forbid call forwarding cascading. By default, multiple call forwards are allowed and if the last called person is busy, disconnected or not replying, the caller might be redirected to the voice mail of the first called number (default) or to the last called number. To allow multiple call forwards (default: enabled):

```
CLI(ibc-number)> second-forwarding { enabled | disabled }
```

In case of multiple call forwards and if the last called is not available, the voice mail of first or last called must be chosen:

```
CLI(ibc-number)> forward-to-voicemail { first | last }
```

For call forwarding sake, an alias to forward to the user's voicemail can be used. This alias is the same as the "call voicemail service" keypad (888 by default). This alias is particularly useful with scheduled call forward, for your calls to reach your voicemail directly without ringing at times you are out of office.

2.2.2.7 Follow-Me Service

This service (also called "reach-me" service) is a feature that tries to reach a mobile subscriber: he may be reachable on his fixed line, but also on his mobile phone or home office. The follow-me service instructs the IBC to try to reach the subscriber on a first extension (ex.: fixed line), then on 2nd number (his home office), then on a third one (mobile phone).

To configure the follow-me service:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> follow-me
CLI(ibc-follow-me)> number <1-3> <number> [<timer>]
```

By default, IBC waits for 15 sec (`timer` parameter) before trying the next number.

To suppress a number:

```
CLI(ibc-follow-me)> no number <1-3>
```

To suppress the follow-me service:

```
CLI(ibc-follow-me)> exit
CLI(ibc-number)> no follow-me
```

To re-activate the last programmed follow-me service:

```
CLI(ibc-number)> follow-me
CLI(ibc-number)> exit
```

2.2.2.8 Overflow phone

An overflow phone is the phone that is contacted when a call to a user fails (no call forwards, no voicemail, etc …). It is configured on a per user basis. Overflow phone is set by the command:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> overflow <number>
```

To suppress the overflow phone number:

```
CLI(ibc-number)> no overflow
```

2.2.2.9 Ringing timeout

The ringing timeout is the time after which the call is considered not responding. CFNR, voice mail, etc. are then applied if configured. Default value is 15 seconds.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> ringing-timeout <5-180sec>
```

2.2.2.10 Call Pickup

Call pickup is a service allowing an authorized user to intercept a call destined to another subscriber. The call-pickup feature functions as follows: A calls B, C hears B's phone ringing. C hangs up his phone and dials a specific dial pattern. As a result of call pickup feature, A is connected to C (instead of B; B's phone is no more ringing). Call-pickup is enabled by default.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> call-pickup { enabled | disabled }
```

2.2.2.11 Do Not Disturb

When the Do-Not-Disturb feature is active, IBC plays a message for incoming calls destined to that user, or forwards to voicemail. Command:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> do-not-disturb { enabled | disabled }
```

2.2.3 Services for Outgoing Calls

2.2.3.1 Calling Line Identity Restriction (CLIR)

The CLIR (Calling Line Identity Restriction) is feature hiding the calling number in the network. CLIR is disabled by default.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> clir { enabled | disabled }
```

2.2.3.2 Calling Line Identity Presentation (CLIP)

The alternate identity feature is used to display another number than yours when placing an external call. This alternate number must have been chosen before (please refer to section 3.1.7.3). Once done, you may activate this feature with:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> clip { std | alternate }
```

2.2.3.3 Global directory

The directory service allows the definition of short dial numbers. A global directory is a list of short numbers available for all subscribers and a personal directory can also be configured by any subscriber.

To configure global directory numbers, first enter the following commands:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> global-directory
```

N.B.: there is no limitation on the number of entries in the global directory. Then, enter the full number:

```
CLI(global-dir)> full-number <1-20 digits>
```

Then enter a name (optional) and the short number:

```
CLI(full-number)> short-number <1-20 digits>
CLI(full-number)> name <string>
CLI(full-number)> exit
CLI(global-dir)> exit
```

To suppress an entry in global directory:

```
CLI(global-dir)> no full-number <full-number>
```

2.2.3.4 Personal directory

Personal directory is rather similar to global directory configuration. N.B.: there is no limitation on the number of entries in the personal directory. The same commands can be entered for every phone numbers:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> directory <short-number> <full-number> [ <name> ]
CLI(ibc-number)> no directory <short number>
```

2.2.3.5 Locking a Phone

It is possible to lock outgoing calls from a phone by entering a keypad. To unlock by keypad, the user password must be entered within keypad. By default, the status is unlocked.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> outgoing-call { enabled | disabled }
```

2.2.4 Other services

2.2.4.1 Entering/Exiting a Hunt Group

The hunt groups are defined by the administrator under `ibc-service`. The administrator defines the membership of users to hunt groups. A user may decide not to be member of the group temporarily.

One can enter/exit a hunt group by means of the following commands:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> enter-group <main number of group>
CLI(ibc-number)> enter-all-group
CLI(ibc-number)> exit-all-group
CLI(ibc-number)> exit-group <main number of group>
```

2.2.4.2 Changing PIN Code

The PIN code is the suite of digits dialed as user password when querying voice mail or configuring some personal voice services (example: login). To change the PIN code per CLI:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> phone-password <old-user-password> <new-user-password>
```

2.2.4.3 WiFi to GSM Handover

The WiFi to GSM Handover function deals with dual-phones (WiFi-GSM). When in call on the WiFi interface, a loss of the signal will automatically trigger a new call to the GSM number.

Meanwhile, the other party will be put on hold; and connected automatically once the GSM number is answered.

To manage the handover function:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> handover { enable | disable }
```

By setting the `handover` configuration parameter to `enable`, the function is activated and calls will be triggered.

Remark: the parameter can be set to any type of phones, including non-WiFi phones, but will have no effect in that case. As this feature requires a quick polling, activating this feature when not needed would generate unnecessary network traffic.

2.2.4.4 Busy Lamp Field (BLF)

The objective of BLF is twofold:

- Quick-call function keys on the phones

IP phones connected to IBC usually handle several function keys which can be associated with speed-dial numbers. Pressing these keys will automatically call the defined number. This number can be either an internal or external number, and will be dialed as configured.

- Monitoring and call-pickup on configured fellow users

The purpose of this function is built on the previous, but far more advanced. Once associated to an internal phone number, the user will be able to call this number, monitor the activity of that user and intercept calls to that user with a key press.

Three different statuses may be recognized, and may be extended to four, depending on the phone used.

- FREE: The user is either idle, or with a direct call forward activated, or disconnected with a CFD activated. Usually, this status is represented by an OFF LED.
- RINGING: The user is being called. Usually, this status is represented by a BLINKING LED. If the phone key is pressed in that state, the incoming call is intercepted by the monitoring user.
- BUSY: The user is either in call, or unreachable without any call forward, or in Do-not-disturb mode. Usually, this status is represented by an ON LED.
- If the phone can handle four states, then the BUSY state is cut into two states IN CALL and UNREACHABLE.

To manage BLF:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> phone-configuration
CLI(phone-conf)> [no] phone-key <index> { quick-calls | busy-lamp-field }
                                          <targeted-number> [<label>]
```

`index` is the phone key to be configured.

`quick-calls` or `busy-lamp-field` defines the type of service desired.

`targeted-number` is the phone number to be associated to the phone-key.

`label` (optional) is a string of 32 char at most that will be displayed associated to the phone-key.

Note: the defined label will be displayed ONLY if the phone is able to display alphanumerical characters. When able to display alphanumerical characters, most of the time the displayed string will be limited to a SMALL NUMBERS of CHARACTERS (for example to date between 8 and 10 characters depending on the brand, the model and the firmware release of the phone).

2.2.4.5 Displayed number format

For more explanation, please refer to 3.1.12.

The administrator defines the three prefixes that will be used for the whole IBC.

Each user afterwards can define the format of his incoming calls numbers:

- International numbers can be either displayed with "+" followed by the country code, or with the international prefix followed by the country code.
- National numbers can be either displayed with "+" followed by the country code, or with the international prefix followed by the country code, or with the national prefix.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> international-number-displayed-format { international
                                                       | plus}
CLI(ibc-number)> national-number-displayed-format { international
                                                       | national
                                                       | plus}
```

Use the no form of the commands to have the number displayed unchanged:

```
CLI(ibc-number)> no international-number-displayed-format
CLI(ibc-number)> no national-number-displayed-format
```

2.2.5 Wav file load

This function allows both users and administrators to upload wav files into the IBC. This is fully handled by the web interface.

3 ADMINISTRATOR'S GUIDE

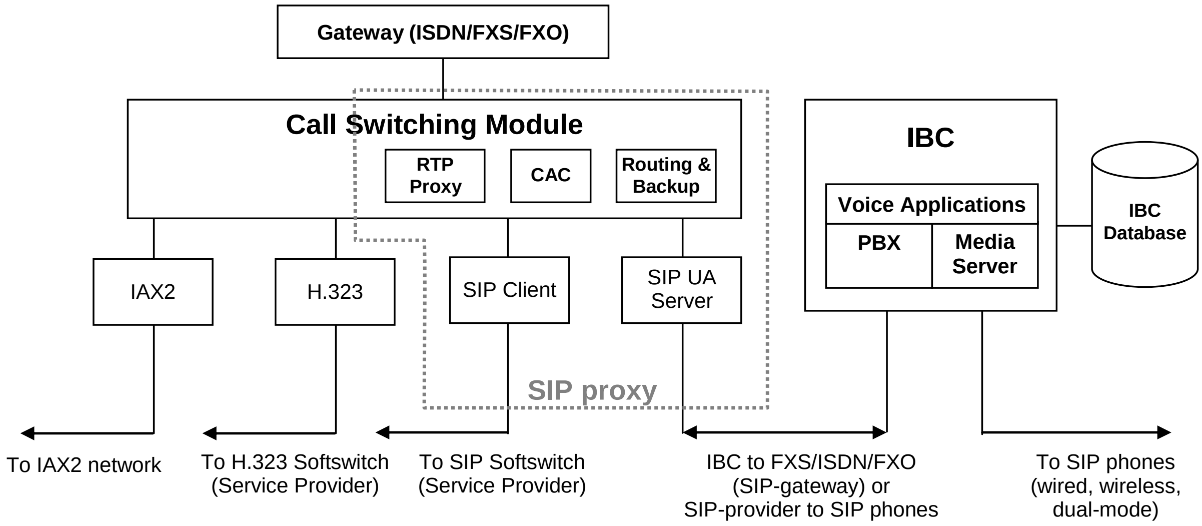
IBC ADMINISTRATOR'S GUIDE

3.1 ADMINISTRATOR'S GUIDE

3.1.1 Introduction

3.1.1.1 Global Architecture

The IBC module is a SIP application server communicating with other devices via SIP (internal or external). The devices can be internal (SIP proxy) or external (SIP phones). The IBC manages a consistent set of voice features for any subscriber type as they are all reached through the SIP protocol. The following diagram summarizes the architecture.


Gateway (ISDN/FXS/FXO)
Call Switching Module
RTP Proxy
CAC
Routing & Backup
IAX2
H.323
SIP Client
SIP UA Server
SIP proxy
IBC
Voice Applications
PBX
Media Server
IBC Database
To IAX2 network
To H.323 Softswitch (Service Provider)
To SIP Softswitch (Service Provider)
IBC to FXS/ISDN/FXO (SIP-gateway) or SIP-provider to SIP phones
To SIP phones (wired, wireless, dual-mode)

The communication call flows go through the following paths:

- The IBC module can "talk" to ISDN/FXS/FXO interface via the SIP proxy that forwards SIP signaling to the SIP server, which then switches the call to the internal gateway. The IBC can manage voice features for ISDN, FXO and FXS subscriber.
- Incoming SIP calls coming from a softswitch are always switched by the SIP proxy towards the IBC. As depicted on the diagram, the SIP proxy is a subset of the Call Switching Module (CSM). The IBC manages the SIP call and forwards the call to the appropriate subscriber (SIP phone or not).
- SIP phone to SIP phone calls are managed by the IBC directly.
- SIP phone to ISDN/FXS phone calls are switched by IBC, then to SIP server and finally to the gateway.
- SIP phone to external number calls must go through the service provider infrastructure. The SIP call is managed by the IBC that routes SIP signaling to the Call Switching Module (CSM). Finally the CSM routes the call to the SIP softswitch or the H.323 softswitch or the IAX2 network.
- External number to external number calls: an incoming call can be received, but IBC may carry out a call transfer on another phone number. As external phone numbers are reached via entities designated as "external-trunks" this case is called trunk-to-trunk connection. A trunk can be a VoIP provider (SIP, H.323 or IAX2)) or ISDN/FXO connected to public legacy PSTN network.

Some additional details are provided in next section.

On top of routing signaling between IBC and the SIP gateway, the Call Switching Function (CSM) has the following roles:

- Translation of signaling in a compatible SIP format with softswitch.
- RTP Proxy (SIP signaling is sent with public IP address of the router instead of the private IBC address; SDP part is translated and NAT ports are controlled in RTP proxy).
- Call admission control: calls might be rejected if too many calls are active on the DSL uplink, in order to avoid congestion.

3.1.1.2 RTP Path

The IBC does not sit on the RTP path: the RTP stream flows directly between SIP termination points. In case of a call between two SIP phones (same LAN), RTP goes directly from one phone to another. For a call between two legacy phones, the RTP stream is looped internally in the SIP gateway. For SIP phone with internal gateway, the RTP flow goes from the phone to the internal gateway. In case of SIP phone call to a SIP/H.323 provider subscriber, the RTP stream goes through RTP proxy.

3.1.1.3 Configuring SIP Phones

The IBC module is attached to an IP interface such `fastEthernet 0/0`. You must configure the following parameter values on your IP phone:

- Registrar IP address = IP address of IBC interface (such as the IP of `fastEthernet 0/0`).
- Outbound proxy = not configured.
- SIP server (can be called also SIP proxy on your SIP phone): same as registrar IP.
- Phone number (display name is optional).
- Authentication username (same as phone number) and authentication password.
- DTMF method: DTMF relay in SIP INFO recommended (not RFC2833).
- Packet length: 20 msec. No silence detection.
- Optional: support of hold/retrieve/Call transfer/3-way conference.

Some additional parameters may need to be configured on the SIP phone. The parameters mentioned above are the most important ones.

3.1.1.4 Fix-Mobile Convergence (FMC)

As part of Fix-Mobile Convergence (FMC), some telephony service packages are built to provide one user with a single phone number for its fixed and mobile phones. The solution requires a wireless handset supporting SIP over WiFi and cellular (GSM or 3G). The wireless and fixed phones are managed by IBC through a virtual phone subscriber with a single phone number shared by multiple physical devices.

When the user is in the enterprise premises, the wireless handset can be under WiFi coverage. The wireless phone can thereby register with IBC. By means of this registration, IBC is made aware of user presence. When the wireless phone is registered, incoming calls make all phones ring (phones sharing the same fixed-mobile number).

When the wireless phone is not registered, it is assumed that the user is outside the enterprise premises. Therefore incoming calls are forwarded to the cellular (GSM or 3G) number. It is possible to deactivate permanently the call forward (for example, if the user has forgotten his phone at home. When the user has got his wireless phone again, he can reactivate the feature). If the cellular (GSM or 3G) call is not successful (phone not reachable, no reply or busy), the call is forwarded to voice mail.

If a call is in progress on one of the phones sharing the same FMC number, it is possible to switch the call between these phones. For example, the call has been answered on wireless phone and it is possible to switch call on the fixed line to benefit from a better utilization comfort.

3.1.2 Installing and Upgrading IBC

3.1.2.1 Getting Started

Before installing IBC, please check the software release notes; they provides guidelines to determine if your hardware and boot versions are compatible.

You need 14 MB of free flash space to load IBC (i.e. you probably need to remove the old OneOS first). To check free space, enter the command `show device status flash://`.

An IBC deliverable is made up of two files:

- An OneOS image (installed as usual).
- A TAR archive file containing IBC files (sound messages and external configuration files).

To load a TAR archive (e.g. `ibc_t1.tar`) from FTP, enter such command:

```
CLI> ibc load <ftp://<user>:<password>@<host>/path/ibc_t1.tar>
```

For exact command syntax, please check next section.

3.1.2.2 IBC Database Backup and Restore

The IBC does not require only a simple configuration file such as `bsaStart.cfg`. The IBC has got a database where the voice feature activation of every subscriber is maintained, as well as IVR scripts. The database is saved automatically. At the next reboot, the IBC database is reloaded, so that the user does not need to re-configure their follow-me service for example.

IBC also needs a collection of sound files. To simplify backup and restore of an IBC system, the following functions are implemented: compression/de-compression as tar archive of all IBC files, tar file system download from and export to FTP/TFTP server.

In the next commands the syntax of an URL is:

- `ftp://<user>:<password>@<host>/<pathname>/<filename>` for tar archive with FTP.
- `tftp://<host>/<pathname>/<filename>` for tar archive with TFTP.
- `<path>/<local-file>` for local tar archive.

To transfer from the `url` a TAR archive, extract the included files and load them into the flash memory (where indicated in the TAR archive):

```
CLI> ibc load <url>
```

To unload (erase from the flash memory) some components:

```
CLI> ibc unload { all | database | custom-database | system
                | system-and-sounds | language { en | es | fr | pl} }
```

To save some files on the specified `url`:

```
CLI> ibc save { all | database | database-only [include <file>]
              | custom-database | system | system-and-sounds } <url>
```

The two above commands use aliases to define the IBC files to unload (erase) or save. See below.

Alias	Directories and files (unloaded or saved)
all	/ibc
database	/ibc/conf /ibc/users (including voice mail messages) /ibc/sounds/custom
database-only [include <file>]	/ibc/users (excluding voice mail messages) optional additional <file>
custom-database	/ibc/conf/database.ini
system	/ibc/system tftpboot
system-and sounds	/ibc/sounds/std /ibc/system tftpboot
language xx	/ibc/sounds/std/xx

3.1.2.3 Loading Specific Sound Files

For this section, `size` (0-20000 in kilobytes) is the maximum size of the file that can be downloaded otherwise file transfer is cancelled. 0 (default value) means no size limitation.

The downloaded file must be in `*.tar` format and G.729 encoded.

The following command loads a new music-on-hold file (MOH). This command disables the MOH service while the MOH upgrade is in progress.

```
CLI> ibc load <url> moh [max-size <size>]
```

The following command loads the ringback message for the trunk or the user with specific trunk or user number (see 2.2.2.1 for details). This command disables the ringback service while the upgrade is in progress.

```
CLI> ibc load <url> rbmsg { trunk | personal } <number> [max-size <size>]
```

The following command loads one of the voice mail messages for the user with specific `number`. This command disables the voice mail service while the upgrade is in progress.

```
CLI> ibc load <url> vm type { name | unavailable | busy | temp } <number>
                                                        [max-size <size>]
```

3.1.2.4 Loading CSV file for phone user and directory entry creation

User phone numbers can be created in one time using a CSV file containing the ad hoc information. It is also possible to create global and/or personal directory entries the same way.

The `load` command described in 3.1.2.2 above allows loading a TAR file. The same command can be used to load a CSV file (with file name `*.csv`). As soon as the CSV file is loaded it is parsed for the relevant information and then the phone users or the directory entries are created.

To create phone users, use a CSV file whose first line must contain exactly the following field description:

```
Name;First-Name;Email;Internal-Number;External-Number;Install-Profile;Web-PWD;Phone-PWD;Type;Mac;Pass;RoutPrefix
```

The following lines in the CSV file contain the values (separated by semicolon) of the corresponding fields for the users to be created (one line per user).

The `Internal-Number` field, that contains the internal phone number (the main number), is mandatory. If it is not present the user is not created. If the number already exists in the database, the line is ignored.

The `Name`, `First-Name`, `Email` and `External-Number` fields are optional. When empty, they are replaced by a blank string. The `Install-Profile` field is optional. When empty, the default installation profile is used. The `Web-PWD` and `Phone-PWD` fields are optional. They configure respectively the password for the web access and for the voice mail access. When empty, no password is configured.

The `Type` field defines the type of phone. It can be either `sip` or `legacy`. With a sip phone (default), the `Mac` or `Pass` fields are relevant and exclusive. They are used to identify the phone set either by the indicated MAC address (`AA:BB:CC:DD:EE:FF`) or by the indicated password. With an analog phone, the `RoutPrefix` field is relevant. It must match the corresponding routing prefix in the voice routing table.

Example of file to create phone users:

```
Name;First-Name;Email;Internal-Number;External-Number;Install-Profile;Web-PWD;Phone-PWD;Type;Mac;Pass;RoutPrefix
John;Doe;JohnDoe@myster.com;4526;0100004526;legacy;;;;;;;##123#
Patoulatchy;Marcel;;4528;0100004528;;;;;;4528;4528;
```

Note that no blank line (empty line) is allowed within the CSV file.

To create global and/or personal directory entries, use a CSV file whose first line must contain exactly the following field description:

```
Dir;Full-Num;Short-Num;Name;First-Name;Email;Contact
```

The following lines in the CSV file contain the values (separated by semicolon) of the corresponding fields for the directory entries to be created (one line per entry).

The `Dir` field defines the type of directory. It can be either `global` for the global directory or `<number>` for the personal directory of the user with `<number>` as main number.

The `Full-Num` and `Short-Num` fields are mandatory. They represent the full telephone number and the short dialing code associated with.

The `Name`, `First-Name`, `Email` and `Contact` fields are optional.

Example of file to create directory entries:

```
Dir;Full-Num;Short-Num;Name;First-Name;Email;Contact
global;0146875689,56;Kurosaki; Ichigo;ichigo-kurosaki@bleach.org;john
4526;0656982316,45; Naruki;Inoe;;;
```

Note that no blank line (empty line) is allowed within the CSV file.

3.1.2.5 Updating IBC using TR-69

IBC can be updated using TR-69. IBC update uses the Web Configurator Update process as described in "Web Configurator or IBC Update" section in "CPE WAN Management Protocol (CWMP - TR-69)" chapter of "OneOS – Admin User Guide" document.

3.1.3 Global IBC Configuration

3.1.3.1 SIP Proxy and IBC Interfaces

The IBC service is attached to an IP interface and a specific listening port can be defined for the SIP signaling. These parameters must be specified in the CLI configuration.

A change of the IBC service IP interface (or IP address of the IP interface) or SIP server IP interface requires a shutdown / no shutdown operation of the IBC service.

The IP phones are directly managed by the IBC service: the SIP phones register with IBC (not with SIP proxy) and the SIP signaling from SIP phone is always switched by IBC. Therefore the SIP UA-Server interface of the SIP proxy is internal; for example:

```
sip-server
 interface loopback 1
 no shutdown
exit
```

The IBC communicates with the SIP proxy via the IP address of loopback 1. The IBC must be attached to the IP interface used by the IP phones as registrar and proxy IP:

```
CLI(configure)> ibc-service
CLI(ibc)> shutdown
CLI(ibc)> interface <type>.<unit>
CLI(ibc)> sip-proxy { internal | address <A.B.C.D>[:<port>] }
CLI(ibc)> sig-port 5200
CLI(ibc)> rtp-port-range 10000 10200
CLI(ibc)> max-expiry 3600
CLI(ibc)> display
CLI(ibc)> no shutdown
CLI(ibc)> exit
```

The default `sig-port` (UDP port for SIP) is 5060. Only the `sip-proxy internal` command is supported (default: `sip-proxy internal`).

The default `rtp-port-range` is 10000-20000. You can define any `rtp-port-range` which contains at least 100 ports, between 1024 and 65535.

`max-expiry` is the registration expiration time; it is the time after which the SIP phones have to re-register. The default value is 30 seconds. You can define any time between 15 and 72,000 seconds.

3.1.3.2 VoIP Dial-Peers

The SIP proxy needs to route incoming calls to a destination. The destination can be legacy subscriber; in that case, such subscriber is known as a `dial-peer voice pots`. If the destination is a VoIP entity (internal –IBC/SIP phone- or external –SIP/H.323 provider-), the destination is identified as a `dial-peer voice voip`.

The VoIP dial-peer for IBC is configured as follows:

```
CLI(configure)> dial-peer voice voip <id>
CLI(voip)> sip-ua ip-static <address of ibc>
CLI(voip)> sig-protocol sip
CLI(voip)> exit
```

Here is an example for the VoIP dial-peer for H.323-provider:

```
CLI(configure)> dial-peer voice voip <id>
CLI(voip)> sig-protocol h323
CLI(voip)> exit
CLI(configure)> h323-gateway
...
CLI(h323-gw)> exit
```

3.1.3.3 External Trunk Configuration

An external trunk is a network port, where IBC dialogs with phone numbers that are not managed by IBC. An external trunk basically represents a port to the public network. External trunks are:

- A VoIP access to SIP or H.323 provider.
- An ISDN port or group of ISDN ports.
- A FXO port or group of FXO ports.
- A VoIP access to IAX2 network.

The port is selected regarding dialing information (`dial-prefix`). If a backup service must be provided (VoIP with ISDN backup), the configuration is done only in the SIP proxy, not in IBC service.

To start configuring an external trunk, please enter the next commands:

```
CLI(configure)> ibc-service
CLI(ibc)> external-trunk
CLI(external-trunk)> trunk <1..10>
CLI(trunk)>
```

The two following parameters are for information only (to help reading the configuration). They are not mandatory for IBC to work properly.

A name can be set for a trunk (informational):

```
CLI(trunk)> trunk-name <name>
```

To remove the trunk name:

```
CLI(trunk)> no trunk-name
```

A type can be set for a trunk (informational):

```
CLI(trunk)> trunk-type { sip | h323 | isdn | fxo | iax }
```

Note: For IAX2 trunking, the above command is mandatory. It then enters in IAX configuration mode.

```
CLI(trunk)> trunk-type iax
CLI(iax)>
```

The local IAX2 user name and password can be configured using the following command in IAX configuration mode. Username and password are strings of 64 characters at most.

```
CLI(iax)> local username <name> secret <password>
```

The remote IAX2 peer name and password can be configured using the following command in IAX configuration mode. Username and password are strings of 64 characters at most.

```
CLI(iax)> peer username <name> secret <password>
```

The remote IAX2 peer address or hostname can be configured using the following command in IAX configuration mode.

```
CLI(iax)> peer address { <ip-address> | <hostname> }
```

To remove the remote IAX2 peer address or hostname, use the `no` form of the above command:

```
CLI(iax)> no peer address
```

The authentication method can be configured using the following command in IAX configuration mode.

```
CLI(iax)> authenticate { md5 | plaintext }
```

To disable authentication (default), use the `no` form of the above command:

```
CLI(iax)> no authenticate
```

The registration method can be configured using the following command in IAX configuration mode.

```
CLI(iax)> register outbound
```

To disable registration (default), use the no form of the above command:

```
CLI(iax)> no register
```

Then exit the IAX configuration mode to go on with the configuration of the trunk. Note that IAX2 service has also to be configured in IBC configuration mode (see 3.1.3.4).

```
CLI(iax)> exit
CLI(trunk)>
```

The following commands in trunk configuration mode are all available whatever the trunk type is.

A dial-prefix can be configured on a trunk. This designates the phone numbers handled within this trunk. If no dial-prefix is configured, any call coming from an internal phone and with an unknown number will be routed to the trunk. IBC routes calls based on called number. If the called number does not correspond to a phone number managed by IBC (such as SIP phone number), IBC routes the call to external trunks.

```
CLI(trunk)> dial-prefix <number>
```

It is usually necessary to add a prefix to called number for calls from IBC to SIP-provider. Vice-versa, incoming calls from SIP-provider carry this prefix (and the prefix is internally removed in IBC). This prefix is thus necessary for an H.323/SIP trunk. To configure this prefix and the trunk type, enter the following commands (default: no routing-prefix):

```
CLI(trunk)> routing-prefix <pattern>
```

IBC routes outgoing calls to a trunk and the caller number is the external phone number. If the caller does not have an external phone number, IBC can route the call if the default trunk identity is configured. The default identity is a public number that phones without public number must use for outgoing calls:

```
CLI(trunk)> default-identity <nbr>
```

To remove the default-identity number:

```
CLI(trunk)> no default-identity
```

IBC routes an incoming call from a trunk to the extension corresponding to the called number. If the called number is not configured in the system, the default-routing number can be configured. This number can be a receptionist for example. To configure the default-routing number:

```
CLI(trunk)> default-routing <nbr>
```

To remove the default-routing number:

```
CLI(trunk)> no default-routing
```

If the general ringing feature is active, any calls incoming from the trunk will make a special phone ring. This feature can be used for example to make an outdoor bell ring. It is configured with the next command:

```
CLI(trunk)> force-ringing <nbr>
```

To remove the force-ringing feature (by default, the feature is disabled):

```
CLI(trunk)> no force-ringing
```

The following command activates a ringback message for any incoming call on this trunk. By default, it is disabled. For more information on ringback message, please refer to section 2.2.2.1. The command is:

```
CLI(trunk)> ring-back-message { enabled | disabled }
```

The following commands define how the phone numbers are sent over the trunk (please refer to 3.1.11):

```
CLI(trunk)> international-number-displayed-format { international
                                                   | plus }
CLI(trunk)> national-number-displayed-format { international
                                                   | national
                                                   | plus }
```

It is possible to globally limit the number of calls over the trunk. It is also possible to configure a guaranteed number of incoming or outgoing calls that can be processed over the trunk:

```
CLI(trunk)> max-calls <max-number>
          [{ guaranteed-incoming | guaranteed-outgoing } <guaranteed-number>]
```

To remove the limitation of calls over the trunk (by default, the feature is disabled):

```
CLI(trunk)> no max-calls
```

A trunk-to-trunk connection is an incoming external call forwarded to another external call. Trunk-to-trunk connections should be limited in duration, because it makes possible to create call loops. If trunk-to-trunk: is enabled, trunk-to-trunk call is by default enabled and released after 24 hours:

```
CLI(trunk)> tr-tr-connection { disabled | enabled <hours> }
```

The following command activates an alternative behavior in the case of a trunk-to-trunk connection. By default, the number displayed as caller on the network is the first caller (external to IBC). With this option set, the number displayed as caller is the last forwarder from within IBC (internal to IBC). The command is:

```
CLI(trunk)> calling-number-restrictive
```

To remove the calling-number-restrictive feature (by default, the feature is disabled):

```
CLI(trunk)> no calling-number-restrictive
```

To complete the configuration:

```
CLI(trunk)> exit
CLI(external-trunk)> exit
CLI(ibc)> exit
```

3.1.3.4 IAX configuration

IAX is an "all in one" protocol for handling multimedia in IP networks. It combines both control and media services in the same protocol. In addition, IAX uses a single UDP data stream on a static port greatly simplifying Network Address Translation (NAT) gateway traversal, eliminating the need for other protocols to work around NAT, and simplifying network and firewall management.

IAX employs a compact encoding that decreases bandwidth usage and is well suited for Internet telephony service.

The IAX protocol version 2 (IAX2) is managed by IBC. Beside the IAX2 trunk configuration (see 3.1.3.3) IAX2 needs some configuration to perform.

To start configuring IAX2, please enter in IBC service configuration mode:

```
CLI> configure terminal
CLI(configure)> ibc-service
CLI(ibc)>
```

By default the IP source address used by IAX2 frames is the one of the outgoing interface. To use the IP address of another interface, use the following command in IBC configuration mode:

```
CLI(ibc)> iax interface <type>.<unit>
```

To return back to the default setting, use the following command (or the no form of the above command):

```
CLI(ibc)> iax interface any
```

By default IAX2 protocol uses the UDP port number 4569. To define another port, use the following command in IBC configuration mode:

```
CLI(ibc)> iax port <0-65535>
```

To return back to the default port, use the following command:

```
CLI(ibc)> no iax port
```

When registration is enabled at trunk level, a default registration expiration of 60 seconds is assumed. To define another expiration value (in seconds), use the following command in IBC configuration mode:

```
CLI(ibc)> iax register expire <0-4294967295>
```

To return back to the default expiration value, use the following command:

```
CLI(ibc)> no iax register expire
```

To complete the configuration:

```
CLI(ibc)> exit
CLI(configure)> exit
CLI>
```

To debug IAX2 traces, the following command is recommended:

```
CLI> debug ibc iax
```

To disable IAX2 traces, use the no form of the above command:

```
CLI> no debug ibc iax
```

To display IAX2 configuration, use the following command in global mode:

```
CLI> show ibc iax
IAX peer 'panda' [2]:
  dial prefix '1'
  local-address 200.1.1.2:4569
  local username panda, secret bamboo, register sent every 60 sec
  peer address foo.bar.com(179.19.19.19):4569
  peer username monkey, secret banana, not registered
  authentication method md5
  active calls 2/limit 6
```

To display IAX2 statistics:

```
CLI> show ibc statistics iax
IAX statistics
  IN:  59349 control frames, 4120077 media frames
       0 bad frames, 0 authentication failures
  OUT: 61036 control frames, 4122059 media frames
       4 send errors
  outstanding frames: 0 (0 ingress, 0 egress)
  frames in transmit queue: 0 dead, 0 final, 0 total
  timing ticks 4174204
```

3.1.3.5 Keypad Profile

A keypad profile contains the list of feature activation codes. The profile index 1 is defined by default. The next CLI command list shows how to restore default index 1 settings:

```
CLI> configure terminal
CLI(configure)> ibc-service
CLI(ibc)> keypad-profile
CLI(keypad)> index 1
CLI(index)>

! admin functions (keypad cannot be modified)

! phone installation
CLI(index)> install-phone              **1
! Usage, dial: **1[<profile-id>]*<IBC-admin-password>[*<internal number>]

! phone configuration
CLI(index)> conf-phone-ddi             **2
! Usage, dial: **2[<profile-id>]*<IBC-admin-password>[*<external number>]

! phone uninstallation
```

```
CLI(index)> uninstall-phone            **0*
! Usage, dial: **0*<IBC-admin-password>[*<internal number>]


! privacy / login / logout functions

! remove all users logged on a phone
CLI(index)> all-users-logout           *10
! Usage, dial: *10

! ask for all users logged on a phone
CLI(index)> ask-in-login-state         **10
! Usage, dial: **10

! remove all login of the current user on any phone
CLI(index)> reset-login                *100
! Usage, dial: *100

! ask for all login of the current user on any phone
CLI(index)> ask-out-login-state        **100
! Usage, dial: **100

! permanent user login
CLI(index)> user-login                 *111*
! Usage, dial: *111*<internal number>*<user-password>

! login as dual wired phone: it behaves as if all phones were on the same
! wire tap. All phones ring when the logged phone is called.
CLI(index)> login-as-wirelinephone     *112*
! Usage, dial: *112*<internal number>*<user-password>

! login as dual wireless phone: same as wired phone, but when the logged
! phone is no more registered, the user is considered as away.
CLI(index)> login-as-dualphone         *113*
! Usage, dial: *113*<internal number>*<user-password>

! permanent / wired / wireless user logout
CLI(index)> user-logout                *110
! Usage, dial: *110

! one call login
CLI(index)> onecall-login              *115*
! Usage, dial: *115*<internal number>*<user-password>*<called-number>

! suspend dual phone login
CLI(index)> suspend-logged-dualphones  *116*0
! Usage, dial: *116*0

! restore dual phone login
CLI(index)> restore-logged-dualphones  *116*1
! Usage, dial: *116*1

! shared line (for incoming calls) login
CLI(index)> user-rcv-login             *121*
! Usage, dial: *121*<internal number>*<user-password>

! shared line (for incoming calls) logout
CLI(index)> user-rcv-logout            *120*
! Usage, dial: *120*<internal number>

! change user password
CLI(index)> new-password               *14*
! Usage, dial: *14*<user-password>*<new-user-password>

! phone lock/unlock (disabling/enabling outgoing calls
CLI(index)> disable-outgoing-call      *17
CLI(index)> enable-outgoing-call       *18*
! Usage, dial: *18*<user-password>
! call forwarding functions

! disable all call forwarding (except scheduled CFU)
CLI(index)> disable-cf-all             *20

! Call Forwarding on No Reply (CFNR)
CLI(index)> set-cfnr                   *21*      ! activation
! Usage, dial: *21*<number>
CLI(index)> disable-cfnr               *21*0     ! deactivation
CLI(index)> enable-cfnr                *21       ! reactivation
CLI(index)> ask-cfnr                   **21      ! query status

! Call Forwarding on Busy (CFB)
CLI(index)> set-cfb                    *22*      ! activation
! Usage, dial: *22*<number>
CLI(index)> disable-cfb                *22*0     ! deactivation
CLI(index)> enable-cfb                 *22       ! reactivation
CLI(index)> ask-cfb                    **22      ! query status


! Call Forwarding on No Reply or Busy (CFNR+CFB)
CLI(index)> set-cfnr-cfb               *23*      ! activation
! Usage, dial: *23*<number>
CLI(index)> disable-cfnr-cfb           *23*0     ! deactivation
CLI(index)> enable-cfnr-cfb            *23       ! reactivation
CLI(index)> ask-cfnr-cfb               **23      ! query status

! Call Forwarding on Disconnected (CFDI)
CLI(index)> set-cfdi                   *24*      ! activation
! Usage, dial: *24*<number>
CLI(index)> disable-cfdi               *24*0     ! deactivation
CLI(index)> enable-cfdi                *24       ! reactivation
CLI(index)> ask-cfdi                   **24      ! query status

! Call Forwarding on Disconnected or No answer (CFDI+CFNR)
CLI(index)> set-cfdi-cfnr              *25*      ! activation
! Usage, dial: *25*<number>
CLI(index)> disable-cfdi-cfnr          *25*0     ! deactivation
CLI(index)> enable-cfdi-cfnr           *25       ! reactivation
CLI(index)> ask-cfdi-cfnr              **25      ! query status

! Call Forwarding on Disconnected or Busy (CFDI+CFB)
CLI(index)> set-cfdi-cfb               *26*      ! activation
! Usage, dial: *26*<number>
CLI(index)> disable-cfdi-cfb           *26*0     ! deactivation
CLI(index)> enable-cfdi-cfb            *26       ! reactivation
CLI(index)> ask-cfdi-cfb               **26      ! query status

! Call Forwarding on Disconnected or No answer or Busy (CFDI+CFNR+CFB)
CLI(index)> set-cfdi-cfnr-cfb          *27*      ! activation
! Usage, dial: *27*<number>
CLI(index)> disable-cfdi-cfnr-cfb      *27*0     ! deactivation
CLI(index)> enable-cfdi-cfnr-cfb       *27       ! reactivation
CLI(index)> ask-cfdi-cfnr-cfb          **27      ! query status

! Call Forwarding Unconditional (CFU)
CLI(index)> set-cfu                    *28*      ! activation
! Usage, dial: *28*<number>
CLI(index)> disable-cfu                *28*0     ! deactivation
CLI(index)> enable-cfu                 *28       ! reactivation
CLI(index)> ask-cfu                    **28      ! query status

! Do Not Disturb (DND)
CLI(index)> enable-dnd                 *29*1     ! activation
CLI(index)> disable-dnd                *29*0     ! deactivation
CLI(index)> ask-dnd                    **29      ! query status
```

```
! service functions

! hunting group
CLI(index)> enter-group                *31*      ! enter hunt group
! Usage, dial: *31*<internal number of group>
CLI(index)> exit-group                 *30*      ! exit hunt group
! Usage, dial: *30*<internal number of group>
CLI(index)> enter-all-group            *31       ! enter all hunt groups
CLI(index)> exit-all-group             *30       ! exit all hunt groups

! user monitoring (phone status)
CLI(index)> monitor-user               **32*     ! query user status
! Usage, dial: **32*<internal number>

! off-hook announcement
CLI(index)> enable-vocal-pres-caller             *33*1 ! caller
CLI(index)> enable-vocal-pres-caller-forwarder   *33*2 ! caller+manager
CLI(index)> enable-vocal-pres-forwarder          *33*3 ! manager
CLI(index)> enable-vocal-pres-forwarder-state    *33*4 ! manager+state
CLI(index)> enable-vocal-pres-all                *33*5 ! caller+man.+st.
CLI(index)> disable-vocal-pres                   *33*0 ! none
CLI(index)> ask-vocal-pres                       **33  ! query

! screened forwarding
CLI(index)> enable-screened-forwarding  *34*1    ! forwarder is screened
CLI(index)> disable-screened-forwarding *34*0    ! forwarder is displayed
CLI(index)> ask-screened-forwarding     **34     ! query forwarder state

! ringback message
CLI(index)> enable-ring-back-message    *35*1    ! activation
CLI(index)> disable-ring-back-message   *35*0    ! deactivation
CLI(index)> ask-ring-back-message-state **35     ! query status
CLI(index)> record-ring-back-message    *35*2    ! start record

! overflow phone
CLI(index)> set-overflowing            *36*      ! activation
! Usage, dial: *36*<number>
CLI(index)> disable-overflow           *36*0     ! deactivation
CLI(index)> enable-overflowing         *36*1     ! reactivation
CLI(index)> ask-overflowing            **36      ! query status

! Interactive Voice Responder
CLI(index)> conf-ivr                   *37*      ! entering configuration
! Usage, dial: *37*<IVR-id>

! vocal messages
CLI(index)> listen-message             *38*      ! listen to message
! Usage, dial: *38*0*<IVR-id><message path>      ! listen IVR message
! Usage, dial: *38*1                             ! listen ring-back msg
! Usage, dial: *38*2*<IBC-admin-password><trunk-id> ! listen trunck msg
! Usage, dial: *38*3*<IBC-admin-password>        ! listen music on hold
CLI(index)> record-message             *39*      ! record IVR message
! Usage, dial: *39*0*<IVR-id><message path>
CLI(index)> update-ivr-messages        **39*     ! update IVR messages
! Usage, dial: **39*0*<IVR-id>


! dialing (redial) / answering functions

! call pickup (when ringing)
CLI(index)> allow-pickup               *41       ! pickup authorisation
CLI(index)> disallow-pickup            *40       ! pickup interdiction
CLI(index)> ask-pickup-state           **41      ! query pickup status
CLI(index)>
CLI(index)> pickup                     *44       ! pickup from group
CLI(index)> pickup-nb                  *44*      ! pickup given number
```

```
! Usage, dial: *44*<number>

! retrieve call that has been forwarded
CLI(index)> intercept-call             *42       ! pickup forwarded call

! call waiting (double call)
CLI(index)> enable-call-waiting        *43*1     ! activation
CLI(index)> disable-call-waiting       *43*0     ! deactivation
CLI(index)> ask-call-waiting           **43      ! query status

! delete all recall number (last caller, last called, waiting ccbs)
CLI(index)> delete-caller-called-ccbs  *50

! recall last (incoming) missed call
CLI(index)> recall-last-missed-call    *51       ! recall missed call
CLI(index)> delete-last-missed-call    *51*0     ! erase caller info
CLI(index)> ask-last-missed-call       **51      ! query caller info

! recall last (incoming / outgoing) call
CLI(index)> recall-last-caller-called  *52       ! recall last call


! redial last (incoming call) caller
CLI(index)> redial-last-caller         *53       ! recall last incoming
CLI(index)> delete-last-caller         *53*0     ! erase caller info
CLI(index)> ask-last-caller            **53      ! query caller info

! redial last (outgoing call) called
CLI(index)> redial-last-called         *54       ! recall last outgoing
CLI(index)> delete-last-called         *54*0     ! erase called info
CLI(index)> ask-last-called            **54      ! query called info

! automatic recall on CCBS
CLI(index)> enable-ccbs                *55*1     ! allow recall on CCBS
CLI(index)> disable-ccbs               *55*0     ! deny recall on CCBS
CLI(index)> ask-ccbs                   **55      ! query CCBS status
CLI(index)> delete-waiting-ccbs        *56       ! erase pending recall
CLI(index)> ask-waiting-ccbs           **56      ! query pending recall

! Calling Line Identity Restriction (CLIR)
CLI(index)> enable-clir                *65*1     ! activation
CLI(index)> disable-clir               *65*0     ! deactivation
CLI(index)> clir-state                 **65      ! query status
CLI(index)> temp-clir                  *66*      ! activation one call
! Usage, dial: *66*<number>

! scheduled CFU
CLI(index)> activate-scheduled-cfu      *728*    ! activation
! Usage, dial: *728*<number>*<day><id>*<hhmm-beg>*<hhmm-end>
! day=1-7 (1 Monday, 0 all days); id=1-4 (sched. CFU identifier)
CLI(index)> deactivate-scheduled-cfu    *728*0*  ! deactivation
! Usage, dial: *728*0*<day><id>
CLI(index)> activale-last-scheduled-cfu *728*1*  ! reactivation
! Usage, dial: *728*1*<day><id>
CLI(index)> ask-scheduled-cfu           **728*   ! query sched. CFU
! Usage, dial: **728*<day><id>

! speed dial, directory dialing
CLI(index)> directory-dial             *74*      ! dial speed number
! Usage, dial: *74*<short-number>
CLI(index)> directory-insert           *75*1*    ! create speed number
! Usage, dial: *75*1*<short-number>*<full-number>
CLI(index)> directory-setup            *75*2     ! using IVR
CLI(index)> directory-delete           *75*0*    ! erase speed number
! Usage, dial: *75*0*<short-number>
CLI(index)> directory-ask              **75*     ! query speed number
! Usage, dial: **75*<short-number>
! forwarding functions

! voice mail of the first or last user when multiple forwarding
CLI(index)> first-forward-to-voicemail          *84*0 ! first
CLI(index)> end-forward-to-voicemail            *84*1 ! last
CLI(index)> ask-forward-to-voicemail-state      **84  ! query

! follow-me
CLI(index)> conf-follow-me             *85*      ! activation
! Usage, dial: *85*<number 1>*<number 2>*<number 3>
CLI(index)> disable-follow-me          *85*0     ! deactivation
CLI(index)> conf-follow-me-ln          *85*1     ! reactivation
CLI(index)> setup-follow-me            *85*2     ! using IVR
CLI(index)> ask-follow-me-state        **85      ! query follow-me

! cascading multiple call forwarding
CLI(index)> allow-second-forwarding     *86*1    ! allow
CLI(index)> deny-second-forwarding      *86*0    ! deny
CLI(index)> ask-second-forwarding-state **86     ! query


! call forward rejection
CLI(index)> deny-cf                    *89*1     ! deny call forward
CLI(index)> accept-cf                  *89*0     ! allow call forward
CLI(index)> deny-cf-state              **89      ! query call forward


! miscellaneous functions

! voice mail
CLI(index)> voicemail                  888       ! entering voice mail
CLI(index)> leave-voicemail            888*      ! leaving a message

! language (1 = fr, 2 = en, ...)
CLI(index)> set-language               *9        ! language of IBC
CLI(index)> ask-language               **9       ! query language

CLI(index)> exit
CLI(keypad)> exit
CLI(ibc)> exit
CLI(configure)> exit
CLI>
```

3.1.3.6 Voice Routing

Remark: the Call Switching Module (CSM) has the role to carry out voice call routing. If CSM routes a call from SIP to SIP, CSM behaves as a SIP proxy.

Voice Routing refers to routing a call flow through the various OneOS modules and finding the final destination of a call. As all calls must be controlled by IBC, some call flows require SIP signaling to enter CSM two-times (first, from CSM to IBC and secondly from IBC to CSM). In order to discriminate the way-in and the way-out to IBC, the recommended solution is the use of prefix #98 as discriminator. The way this routing is realized is further explained below.

Remark: voice-routing re-uses other OneOS components (especially CSM). The drawback of this approach is: the CLI configuration can be quite complex. The advantage though is an unmatched flexibility. The voice-routing can manage call backup from VoIP network to ISDN. You can also configure some ports no to be managed by IBC (such as FXS ports for fax-machines).

Definitions:

- SIP phone: wired or wireless or dual-band SIP phone.
- Legacy subscriber: phone subscriber attached to the product using a traditional technology (ISDN, FXS).
- External call: the called number can be reached via SIP provider (i.e. via SIP softswitch).

- Internal call: the call must be established between two subscriber attached to the OneOS-based voice-capable router.

The rules for call routing in CSM are the following:

1. Match any number for incoming call from SIP/H.323 provider. The called number gets #98 as prefix. Route the call to IBC.
2. Match called numbers starting with #98 prefix. Remove the prefix #98 and route the call to SIP/H.323 provider.
3. Optional: match called number with #98 prefix, remove the prefix and route the call to a backup interface (FXO, ISDN S0).
4. For any other called number (from gateway or SIP/H.323 provider), route the call to IBC (except for calls coming from IBC).
5. For any other called number (from IBC), route the call to ISDN/FXS/FXO interfaces.
6. In IBC, if the call is external, add the prefix #98. Incoming external calls carry the #98 prefix.

Here is a list of voice routing cases and associated processing:

Calling	Called	Call Path
SIP phone	SIP Phone	SIP ➔ IBC ➔ SIP
SIP Phone	Legacy	SIP ➔ IBC ➔ SIP-server ➔ CSM ➔ gateway
Legacy	SIP phone	Gateway ➔ CSM ➔ SIP-server ➔ IBC ➔ SIP phone
Legacy	Legacy	gateway ➔ CSM (adds #98 prefix in calling number) ➔ SIP-server ➔ IBC (identifies internal call, removes #98 prefix) ➔ SIP-server ➔ SIP-gateway
External	SIP phone	SIP-provider ➔ CSM (adds #98 prefix in calling number) ➔ SIP-server ➔ IBC (removes #98 prefix) ➔ SIP-phone
SIP phone	External	SIP-phone ➔ IBC ➔ SIP-server ➔ CSM ➔ SIP provider
Legacy	External	gateway ➔ CSM (adds #98 prefix) ➔ SIP-server ➔ IBC ➔SIP-server ➔ CSM (removes #98) ➔ SIP provider
External	Legacy	Sip provider ➔ CSM (adds #98 prefix) ➔ SIP-server ➔ IBC (identifies internal call, removes #98 prefix) ➔ SIP-server ➔CSM ➔ gateway

Let us assume `dial-peer voip 0` is the SIP provider and `dial-peer voip 1` is IBC. The configuration looks as follows:

```
ibc-service
 interface fastEthernet 0/0
 external-trunk
   trunk 1
     ! if the user dials anything starting by 0, that's external call
     dial-prefix 0
     trunk-type sip
     routing-prefix #98
   exit
 exit
 no shutdown
exit
voice-routing
route 1
! a prefix is added to identify an external call
! (coming from voip provider)
! The route has got the type 'incoming'. In other words, the rule matches
! calls coming from Voip 0 (SIP provider)
  dial-peer voip 0
  prefix .
  prefix-type incoming calling last
  insert-prefix #98 calling
 exit
route 2
```

```
! a #98 prefix is required to route to the voip provider
! then, the prefix is removed and the call routed to Sip provider.
  dial-peer voip 0
  prefix #98.
  prefix-type outgoing called last
  suppress-prefix 3 called
 exit
! default route to IBC, except for calls coming from IBC (by default, no
! loop allowed.
 route 3
  dial-peer voip 1
  prefix .
 exit
! ISDN/FXS subscriber must be configured
! and registered with SIP provider. => dial-peer pots <id> ua-sip
 route 5
  dial-peer pots 5 ua-sip
  prefix 0141877XXX length 10
  sip-username 0141877000
  sip-authentication my_sip_regid mypassword
 exit
exit
```

3.1.4 Restricting Outgoing Calls

On a per-user basis, it is possible to restrict the phone numbers that the user is allowed to dial. For example, this is designed to prevent employees from calling abroad or toll phone services e.g. weather announcement.

To apply such restriction on a user, one must first define a profile. The profile contains filtering rules. The rules are made up of a dial pattern and a (permit or deny) action. The default rule defines the behavior of filtering.

- If the default-rule is "permit", all deny rules are scanned first. If the called number matches a deny rule, the permit rules are scanned. If the number matches a deny rule and a permit rule, the default-rule applies, i.e. the call is permitted. If the called number matches only a deny rule, the call is not accepted. If the dialed number does not match deny and permit rule, the call is accepted. Example: one rule is `deny 01` and one rule is `permit 0141`; therefore, 0141877000 is accepted but not 013210101010.
- If the default-rule is "deny", all permit rules are scanned first. If the called number matches a ‘ermit rule, the deny rules are scanned. If the number matches a deny rule and a permit rule, the default-rule applies, i.e. the call is denied. If the called number matches only a permit rule, the call is accepted. If the called number does not match any deny/permit pattern, the call is rejected. Example: one rule is `deny 0141` and one rule is `permit 01`; therefore, 0141877000 is not accepted but 013210101010 is accepted.

To start configuring a new restriction profile:

```
CLI(configure)> ibc-service
CLI(ibc)> out-call-restriction
CLI(out-call-restriction)> profile <1-10>
```

To set the default behavior (default: default-rule deny):

```
CLI(out-call-restriction)> default-rule { permit | deny }
```

To add a rule:

```
CLI(out-call-restriction)> permit <dial-prefix>
CLI(out-call-restriction)> deny <dial-prefix>
```

To remove a rule:

```
CLI(out-call-restriction)> no permit <dial-prefix>
CLI(out-call-restriction)> no deny <dial-prefix>
```

The `dial-prefix` is the list of first digits of the called number. Up to 50 rules are supported within an out call restriction profile.

3.1.5 Restricting Voice Features

It is sometimes required not to provide all voice features to a user. For example, voice mail should be disabled for a fax machine. The list of supported services for a phone number is configured within a service profile. Then the service profile is applied onto a phone number.

To start configuring a service profile:

```
CLI(configure)> ibc-service
CLI(ibc)> services-profile
CLI(services-profile)> profile <1-10>
CLI(profile)> name <profile-name>
CLI(profile)> permit call-waiting
CLI(profile)> deny call-waiting
CLI(profile)> permit ccbs
CLI(profile)> deny ccbs
CLI(profile)> permit cf-all
CLI(profile)> deny cf-all
CLI(profile)> permit cf-extern
CLI(profile)> deny cf-extern
CLI(profile)> permit clip
CLI(profile)> deny clip
CLI(profile)> permit clir
CLI(profile)> deny clir
CLI(profile)> permit disa <disa-profile:1-10>
CLI(profile)> deny disa <disa-profile:1-10>
CLI(profile)> permit dnd
CLI(profile)> deny dnd
CLI(profile)> permit external-call
CLI(profile)> deny external-call
CLI(profile)> permit follow-me
CLI(profile)> deny follow-me
CLI(profile)> permit group-mgmt
CLI(profile)> deny group-mgmt
CLI(profile)> permit park
CLI(profile)> deny park
CLI(profile)> permit phone-login
CLI(profile)> deny phone-login
CLI(profile)> permit pickup
CLI(profile)> deny pickup
CLI(profile)> permit ring-back-message
CLI(profile)> deny ring-back-message
CLI(profile)> permit screen-forwarder
CLI(profile)> deny screen-forwarder
CLI(profile)> permit second-forwarding
CLI(profile)> deny second-forwarding
CLI(profile)> permit user-login
CLI(profile)> deny user-login
CLI(profile)> permit vocal-pres
CLI(profile)> deny vocal-pres
```

3.1.6 User Profiles

The user profiles define the default user settings. All users installed by keypad inherit from the profile. Also, user settings can be reset to retrieve the profile parameters. For example: profile 1 represent settings of standard user and profile 2 represent settings for a fax/modem.

To start configuring a user profile:

```
CLI(configure)> ibc-service
CLI(ibc)> install-profile
CLI(install-profile)> profile <1..10>
 call-pickup                     - install call-pickup
 call-waiting                    - install service call-waiting
 ccbs                            - set ccbs
 cfb                             - set default cfb
 cfd                             - set default cfd
 cfnr                            - set default Cfnr
 cfu                             - set default cfu
 clip                            - set default CLIP
 clir                            - set default CLIR
 dnd                             - set installation dnd
 forward-to-voicemail            - set forward to voicemail
 forwarded-call                  - set authoris. To use Forwarded Calls
 hunting-group                   - set default hunting-group
 language                        - set default language
 name                            - set profile name
 out-call-restriction-profile    - set default outgoing call restrict prof
 overflow                        - add overflow number
 ringback-message                - set ringback message
 ringing-timeout                 - set ringing timeout
 scheduled-cfu                   - install scheduled cfu
 screened-forwarder              - set screened-forwarder
 second-forwarding               - set second forwarding
 service-keypad                  - set default keypad profile
 service-profile                 - set default service profile
 voicemail                       - enable voicemail
```

Configuration commands:

```
! Installation profile name
CLI(profile)> name <1..32 char>
CLI(profile)> no name

! Call pickup activation / deactivation (see 2.2.2.10)
CLI(profile)> call-pickup { enabled | disabled }

! Call waiting activation / deactivation (see 2.2.2.4)
CLI(profile)> call-waiting { enabled | disabled }

! CCBS activation / deactivation (see 2.2.2.5)
CLI(profile)> ccbs { enabled | disabled }

! CFB default activation / deactivation (see 2.2.2.6)
CLI(profile)> cfb <forward-to-number>
CLI(profile)> no cfb

! CFD default activation / deactivation (see 2.2.2.6)
CLI(profile)> cfd <forward-to-number>
CLI(profile)> no cfd

! CFNR default activation / deactivation (see 2.2.2.6)
CLI(profile)> cfnr <forward-to-number>
CLI(profile)> no cfnr

! CFU default activation / deactivation (see 2.2.2.6)
CLI(profile)> cfu <forward-to-number>
CLI(profile)> no cfu

! CLIP default format (see 2.2.3.2)
CLI(profile)> clip { std | alternate }

! CLIR activation / deactivation (see 2.2.3.1)
CLI(profile)> clir { enabled | disabled }

! DND activation / deactivation (see 2.2.2.11)
CLI(profile)> dnd { enabled | disabled }
```

```
! Forward to voicemail default format (see 2.2.2.6)
CLI(profile)> forward-to-voicemail { first | last }

! Forwarded call activation / deactivation (see 2.2.2.6)
CLI(profile)> forwarded-call { enabled | disabled }

! Hunting group default activation / deactivation (see 3.1.7.3)
CLI(profile)> hunting-group <group-id> [<priority>]
CLI(profile)> no hunting-group

! Language default format (see 3.1.9.4)
CLI(profile)> language { reset | en | es | fr | pl | ru }

! Outgoing call restriction default profile (see 3.1.4)
CLI(profile)> out-call-restriction-profile <1..10>

! Overflow phone default number (see 2.2.2.8)
CLI(profile)> overflow <overflow-number>
CLI(profile)> no overflow

! Ringback message activation / deactivation (see 2.2.2.1)
CLI(profile)> ring-back-message { enabled | disabled }

! Ringing timeout default value (see 2.2.2.9)
CLI(profile)> ringing-timeout <5-180sec>

! Scheduled CFU default activation / deactivation (see 2.2.2.6)
CLI(profile)> scheduled-cfu <day-id> <schedule-id> <start-time>
                                    <end-time> <forward-to-number>
CLI(profile)> no scheduled-cfu { all | plage <schedule-id>

! Screened-forwarder activation / deactivation (see 2.2.2.3)
CLI(profile)> screened-forwarder { enabled | disabled }

! Second-forwarding activation / deactivation (see 2.2.2.6)
CLI(profile)> second-forwarding { enabled | disabled }

! Service keypad default profile (see 3.1.7.3)
CLI(profile)> service-keypad <1-5>

! Services profile default number (see 3.1.5)
CLI(profile)> service-profile <1-10>
CLI(profile)> no service-profile

! Voicemail default configuration (see 3.1.7.3)
CLI(profile)> no voicemail
CLI(profile)> voicemail internal
CLI(profile)> voicemail internal max-message <0-99>
CLI(profile)> voicemail internal message-duration <3-300 sec>
CLI(profile)> voicemail internal guaranteed-duration <10-3600 sec>
CLI(profile)> voicemail internal email-notify [delete | no-attach]
CLI(profile)> voicemail external <external-number> [voice-mail-id
                                <number>] [pause <1-10 seconds>]
```

The default installation profile is:

```
ibc-service
 install-profile
  profile 1
   service-keypad 1
    out-call-restriction-profile 1
    service-profile 1
    hunting-group 1 1
    voicemail internal message 3
    voicemail internal message-duration 60
   exit
  exit
```

Example: installation profile for fax/modem

```
ibc-service
 service-profile
! a fax modem cannot have forwarded calls to voice mail
! nor call waiting
  profile 2
   deny disa
   deny call-waiting
   deny ccbs
  exit
 exit
 install-profile
  profile 1
   service-keypad 1
    out-call-restriction-profile 1
    service-profile 2
    hunting-group 1 1
    no voicemail
   exit
  exit
exit
```

3.1.7 Phone Configuration

3.1.7.1 Installation Password

A phone can be installed without using the CLI or web interface, but simply by means of keypad. To realize that installation, a password is required (the IBC administrator password). The default installation password is 0000. To modify the password, use the next command:

```
CLI(configure)> ibc-service
CLI(ibc)> admin-password <IBC-administrator-password-number>
```

3.1.7.2 Auto installation of SIP phone

SIP phone can be installed by keypad or auto installation in a plug and play mode. The auto-installed phone gets a free internal phone number between the defined interval of phone numbers reserved for auto installation (between min-ext and max-ext).

```
CLI(configure)> ibc-service
CLI(ibc)> [no] auto-install auto <min-ext> <max-ext> install-profile <n>
```

Or it can be installed by keypad **`**1`** or **`**2`**.

```
CLI(configure)> ibc-service
CLI(ibc)> [no] auto-install keypad internal <pattern>
```

`pattern` is the rule to guess the internal number from a given external number. The pattern must be a number prefix (e.g. 1234) + a wild card (e.g. XXX). Example, if the pattern is 3**XX**, a phone installed with `**2*pass*01987412`**`34`** will have 3**34** for internal number.

Use the `no` form of the command to disable auto-installation (default - listed in show running).

3.1.7.3 Auto provisioning of SIP phone

The configuration of SIP phones can be provisioned by auto provisioning in a plug and play mode. The auto-provisioned phone gets one or more configuration file (usually applying the "standard" company configuration and a phone-related "specific" configuration).

Auto-provisioning takes place when SIP phone is resetting. First, SIP phone gets its IP related parameters (IP address …) from DHCP server (that has to be configured, see an example below). Then, SIP phone gets the configuration files from TFTP server (that has to be configured, refer to "TFTP Server" section of "OneOS – Admin User Guide" document). The configuration file contents are based on the MAC address of SIP phone as well as on other information such as vendor ID (DHCP option 60 …). In same cases, SIP phone configuration is done via HTTP using WEB server (that has to be configured, refer to "Configuring HTTP Server" section of "OneOS - Admin User Guide" document). In same cases, SIP phone gets also directories from LDAP server (that has to be configured, see below).

In that way, auto-provisioning allows an easy to change and safe centralized configuration management that requires no human interaction.

To date, SIP phones from the following vendors can be auto-provisioned: Thomson, Aastra, Linksys, LG-Nortel and Polycom. Personal directory auto-provisioning is available for Thomson and Aastra SIP phones.

The standard configured (static) parameters are the same for all SIP phones. They are stored as configuration files in the `/tftpboot` directory (one file per vendor). They include the following settings:

- Silence suppression (disabled)
- DTMF management (SIP INFO)
- RTP packet time (20 ms)
- Audio codecs (G.729, G.711)

The specific configured (dynamic) parameters are taken on the fly from OneOS and IBC configuration. They include the following settings:

- Language, time zone, daylight saving time
- SIP registrar/SIP proxy address, SIP account
- LDAP, HTTP directories
- Busy Lamp Function and Speed Dial keys
- Phone configuration password

The phone configuration password is meant to protect the critical parameters of the phone configuration. It is randomly generated by IBC and sent to the SIP phone as its "admin" password. The IBC-generated password is valid for all SIP phones managed by the local IBC.

To enable the phone configuration password management, use the following command in IBC service configuration mode (use the `no` form of the command to disable the password management):

```
CLI(configure)> ibc-service
CLI(ibc)> shutdown
CLI(ibc)> [no] auto-provisioning generate-password
CLI(ibc)> no shutdown
CLI(ibc)> exit
```

To modify the generated phone configuration password, use the following command in global mode:

```
CLI> ibc auto-provisioning renew-password
```

Note: following the renew-password command all SIP phones will reboot after 30 seconds in order to take into account the new password. That way, auto-provisioning process will restart and any configuration changes will apply.

To activate the LDAP server and optionally define the password for LDAP authentication, use the following commands in global configuration mode:

```
CLI(configure)> ldap-server address { <interface> | any }
CLI(configure)> ldap-server authenticate simple <password>
```

Use the `no` form of the commands to remove the LDAP authentication and/or deactivate the LDAP server:

```
CLI(configure)> no ldap-server authenticate
CLI(configure)> no ldap-server
```

To debug LDAP server traces, the following command is recommended:

```
CLI> debug ldap-server
```

To query LDAP server statistics:

```
CLI> show ldap-server
LDAP daemon is running on tcp port 389
  4 messages received, 0 format errors, 0 not supported
  authentication: simple, 0 failures
  search: 2 successful, 0 no match
  6 messages sent, 0 send errors
  connections open/closed: 1/2
  Client: 192.168.16.60:43104 connected since JUN 02 15:51 2009 [11]
  username: 8080
  last time heard: 00:00:07 ago
```

Example of DHCP server configuration for auto provisioning (for more information on DHCP server configuration, please refer to "Configuring DHCP Server" section of "OneOS – Basic IP User Guide" document):

```
ip dhcp pool phones
 network 192.168.16.60 255.255.255.240
 next-server 192.168.16.250
 boot-file phone.inf
 default-router 192.168.16.250
 option ascii 66 192.168.16.250
 option ascii 67 phone.inf
 option ip 42 192.168.16.6
exit
```

To display auto provisioning configuration, use the following command in global mode:

```
CLI> show ibc auto-provisioning
Auto-provisioning of SIP phones:
  DHCP server started
  TFTP server started under root directory /tftpboot
  SIP registrar: 200.1.1.1
  Password for phone's admin: 269439
  Timezone: GMT+01:00
```

3.1.7.4 Phone Number and Hunt Groups

The analog & ISDN phones must be configured in the SIP gateway part and the voice-routing.

All the private numbers must be configured:

- phones
- internal services (IVR, etc)
- hunt-groups

Other numbers may be associated to a main private number:

- up to 3 alternate private numbers
- a main external number : used to route the call if it comes from a trunk and used as a calling number for any outgoing call (to a trunk)
- up to 3 alternate external numbers

The maximum number of real users can be set via CLI. "Real user" means phone numbers that are not internal services (that is to say: hunt groups or receptionists). The number of supported users depends on hardware. The next table shows the supported number of users:

Product	Default and Maximum Number of Users
ONE100	20
ONE150	20
ONE180	20
ONE300	20

The maximum number of users can be reduced. The command displays an error if for example 9 users are configured when you enter the command max-users 5. To change the maximum number of users:

```
CLI(configure)> ibc-service
CLI(ibc)> max-users { default | <number> }
```

The system default language is inherited by all newly created users. If the users have set a language where the sound file cannot be found, the system uses the default language sound file:

```
CLI(ibc)> default-language { en | es | fr | pl | ru | hu | reset }
```

Note: the list of available languages is subject to change. `reset` sets the default language (i.e.: en).

The next command defines the minimum available space in flash so that voice mail accepts to record a voice mail (default: 1000):

```
CLI(ibc)> min-disk-space <kbytes>
```

Use the no form of the command to return to the default value:

```
CLI(ibc)> no min-disk-space
```

The external (main and external) numbers can be used for Registration to the SIP VoIP provider. To start configuring phone number, enter the following command:

```
CLI(configure)> ibc-service
CLI(ibc)> numbering-plan
CLI(pv-number)> index { <idx> | 0 }
CLI(index)>
```

`idx` defines the numbering plan entry where the main number is stored. The index is a value from 1 to 100. If you enter `index 0`, the main number will be inserted at the next available index.

Use the no form of the command to remove the number from database:

```
CLI(pv-number)> no index <idx>
```

Use the display command to list the indexes that are used:

```
CLI(pv-number)> display
------------------------
--- Short Phone List ---
------------------------
>>> Index = 1    | Main-Number = 9000
>>> Index = 2    | Main-Number = 7000
>>> Index = 3    | Main-Number = 8000
>>> Index = 4    | Main-Number = 3939
CLI(pv-number)>
```

The main-number parameter is the internal phone number (abbreviated dialing), for example 4321. (Mandatory parameter must be unique).

```
CLI(index)> main-number <1-20 digits>
```

The privilege parameter defines the level of user authorization (`user`: (0) basic user without web access; `manager`: (7); `admin`: (15); default (1): basic user with web access).

```
CLI(index)> privilege-level { <0-15> | admin | manager | user }
```

The alternate-number parameter is an abbreviated number. Internal users can call this alternate-number. Up to 3 alternate numbers are possible. (Optional parameter)

```
CLI(index)> [no] alternate-number <1-20 digits>
```

The main-external parameter is the public phone number, for example 0141874321. (Optional parameter, by default, it is the same as main-number)

```
CLI(index)> [no] main-external <1-20 digits>
```

The alternate-external parameter is an alternate public number. Up to 3 alternate numbers are possible. (Optional parameter)

```
CLI(index)> [no] alternate-external <1-20 digits>
```

The alternate-external-identity parameter is an alternate public number for outgoing calls only. Once set, it may be chosen by the user to display this alternate number instead of his one on any outgoing call. This is classically used to show the number of your hunt group and do not present your actual number. Please refer to 2.2.3 for user's part. (Optional parameter)

```
CLI(index)> [no] alternate-external-identity <1-20 digits>
```

The next parameter defines the SIP display name (optional). Add quotes between the display name string if space characters are necessary. The second parameter defines the first name (optional). If name and first name are configured, the SIP display name is `name_firstname` and the user login for web access is `firstname.name`. Name and first name are 1-32 character long.

```
CLI(index)> [no] name <name> [<first-name>]
```

The next command is an optional attribute with an arbitrary value. It can help in qualifying a user with a specific role.

```
CLI(index)> [no] role <1-32 characters>
```

The next command is an optional attribute that represents contact address data. It can help in associating user data with a phone number for the address book. If the contact string contains space, the string must be entered between quotation marks:

```
CLI(index)> [no] contact <1-128 characters>
```

The `number-type` parameter specifies IBC behavior for the type of phone number:

- `sip-subscriber` must be used for any LAN-side SIP devices (SIP phone, wireless SIP phone, SIP soft phone). A SIP subscriber can be member of a hunt group. (See `hunting-group` and `hunting-mode` commands). Authentication is optional and can be MAC-based or password-based.

```
CLI(index)> number-type sip-subscriber [auth-password <password>
                                      | mac-addr <XX:XX:XX:XX:XX:XX>]
```

- `internal-service` is for services provided by IBC media server (IVR service, voice mail ...). You must then configure the command `internal-service` to specify what internal service is attached to that number.

```
CLI(index)> number-type internal-service
```

- `hunt-group` indicates that the phone number is attached to a group of subscribers. Hunt groups are needed for call distribution when a phone number can be reached on multiple lines. For example, a hotline is accessed by a single phone number, but several persons can answer.

```
CLI(index)> number-type hunt-group <hunt-group id>
```

- `legacy-subscriber` indicates a FXS or ISDN phone

```
CLI(index)> number-type legacy-subscriber routing-prefix <prefix>
```

A SIP or legacy subscriber can be member of up to 4 hunt groups. To attach/detach the phone number to a hunt group:

```
CLI(index)> [no] hunting-group <hunt-group-id 1-10> [<priority: 1-10>]
```

Call distribution within a hunt group can be:

- `simultaneous` (default): the call is sent to all the phones at the same time.
- `cyclic`: any new call is presented to the next phone belonging to the same group. Therefore, the incoming traffic load (in term of number of calls) is shared between all the phones. There is also a backup in case of no response due to busy state: the call is presented to the next phone. The call is dropped if all the free phones have been called. The next new call will be presented to the same phone.
- `priority`: any new call is presented first to the highest priority phone and successively until the lowest priority in case of no response or busy state. If several have the same priority, the call distribution is cyclic.

```
CLI(index)> hunting-mode { simultaneous | cyclic | priority } [<timeout>]
```

The `timeout` parameter is the number of seconds to consider the called party not available and the hunting continues with next phone of the hunt group. Default timeout: 15 seconds.

Example: 6000 is the number of a hunt group. 7001, 7002, 7003 (SIP phones) are set as member of the hunt group.

```
configure terminal
 ibc-service
  numbering-plan
   index 0
    main-number 6000
    number-type hunt-group 1
    hunting-mode simultaneous
   exit
   index 0
    main-number 7001
    hunting-group 1
    number-type sip-subscriber
   exit
   index 0
    main-number 7002
    hunting-group 1
    number-type sip-subscriber
   exit
   index 0
    main-number 7003
    hunting-group 1
    number-type sip-subscriber
   exit
  exit
 exit
exit
```

If the number-type is of type `internal-service`, the internal-service must be provided.

Use the following command to activate the service IVR:

```
CLI(index)> internal-service receptionist <id: 0-9>
```

Use the following command to activate the service allowing reading voicemail from an external phone:

```
CLI(index)> internal-service voice-mail
```

Use the following command to activate the service allowing logging in IBC from an external phone. Then the system treats further action as if the logged user was calling from an internal phone. The user has a limited time to log-in (input-timer) otherwise the attempt is unsuccessful. Only a limited number of unsuccessful attempts are allowed (max-login-attempts) then the call is disconnected.

```
CLI(index)> internal-service disa [max-login-attempts <1-10;default 1>]
                                  [input-timer <3-30 seconds;default 10>]
```

The installation profile is set as follows:

```
CLI(index)> [no] install-profile <1-10>
```

The keypad profile is the list of voice feature activation codes (such as 3131 to call back last caller). The default keypad profile is 1. To use another keypad profile, enter the next command:

```
CLI(index)> service-keypad <1-5>
```

The service profile is the list of voice features enabled for a user. By default, all voice features are allowed (no service profile attached). To use a service profile, enter the next command:

```
CLI(index)> [no] services-profile <1-10>
```

The outgoing call restriction profile contains the list of phone patterns that a user is allowed to dial, enter the next command to assign such profile:

```
CLI(index)> [no] out-call-restriction-profile <1-10>
```

Voice mail can be either internal or external (only).

If voicemail is internal (it means messages are managed by IBC and stored in local flash), voice mail duration can be set. Every user gets a guarantied space to store voice mail. If the user has got already more voice mail that this guarantied space (default: 180 s), recording a new voice mail is permitted if all the following conditions are met:

- The current number of message is lower than the maximum number of message (default: 20).
- The free flash space is greater than the min-disk-space parameter (default: 1MB).

Recording is aborted if the message is longer than the maximum message duration (default: 60 sec).

```
CLI(index)> voicemail internal guaranteed-duration <10-3600 seconds>
CLI(index)> voicemail internal message-duration <3-300 seconds>
CLI(index)> voicemail internal max-messages <0-99>
CLI(index)> voicemail internal email-notify
```

If voice mail is external and a call must be forwarded to voice mail, calls are forwarded to a phone number. If `voice-mail-id` option, the main-external number of called user is sent as DTMF. This series of DTMF allows the external voice mail to identify on which mail box to leave a message. The `pause` argument is the pause between call establishment and the sending of DTMF (default: 3 seconds).

```
CLI(index)> voicemail external <external-number> [voicemail-id <number>]
                                                  [pause <1-10 seconds>]
```

Use the `no` form of the command to remove the voice mail facility:

```
CLI(index)> no voicemail [internal email-notify]
```

Using CSTA (see 3.1.7.5 below), by default a number is able to monitor up to 5 other numbers. To change this value, use the next command. To remove this facility, use the `no` form of the command.

```
CLI(index)> [no] csta max-monitored-users <1-100>
```

A general field for user information is also available to store any specific user details. This field is only accessible from the web interface provided.

3.1.7.5 Computer Supported Telephony Application (CSTA) Server

OneOS IBC provides a CSTA interface to allow the integration of computer application with telephony features. OneOS supports CSTA messages conforming to CSTA phase 3 in XML format. At present, only a CSTA subset is implemented that allows the "Open IBC Connector" program (developed by OneAccess) to click and dial from Microsoft Outlook™. CSTA messages are encapsulated over TCP and may be optionally authenticated.

CSTA is enabled by default on TCP port 3333. To enable/disable the CSTA server and force the TCP port:

```
CLI(configure)> ibc-service
CLI(ibc)> csta-server [tcp-port <1-65535>]
CLI(ibc)> no csta-server
```

Authentication re-uses the same login/password as the web service (disabled by default). To enable/disable authentication:

```
CLI(ibc)> [no] csta-server authenticate
```

Keepalive allows detecting dead CSTA peers. The keepalive is disabled by default and is configured with the next command:

```
CLI(ibc)> no csta-server keepalive
CLI(ibc)> csta-server keepalive <seconds>
```

To debug CSTA traces, the following command is recommended:

```
CLI> debug ibc csta
```

To query CSTA server statistics:

```
CLI> show ibc csta
CSTA server is running on TCP port 3333
```

```
8 connections established, 0 connection failures
2 connections open (limit 10), 1 authentication failures
keepalive interval 3600 secs
30 keepalive probes, 0 connections dropped in keepalive
Client: 192.168.16.6:2082 connected since JUL 09 12:22 2008 [11]
  Last time heard: 00:47:47 ago
  monitored devices: 7080 ref 2172909712
Client: 192.168.16.61:32839 connected since JUL 08 14:22 2008 [25]
  Last time heard: 00:09:04 ago
```

3.1.7.6 Remotely Rebooting an IP Phone

A proprietary SIP message makes it possible to reboot a phone remotely. The format of this message is as follows:

```
NOTIFY sip:def@192.168.1.130:2063 SIP/2.0
Via: SIP/2.0/UDP 192.168.1.128:5060
From: <sip:abc@192.168.1.128>
To: <sip:def@192.168.1.130:2063>
Event: check-sync
Date: Tue, 02 Aug 2005 18:25:36 GMT
Call-ID: 123456789@192.168.1.130
CSeq: 1300 NOTIFY
Contact: <sip:abc@192.168.1.128>
Content-Type: application/simple-message-summary
Content-Length: 0
```

Please check first the document of the IP phone vendor to have the confirmation that this message is supported and if that feature is not disabled on your phone.

To reboot the phone, the following CLI commands must be entered:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> reboot-phone
```

3.1.8 Configurable Interactive Voice Response (IVR) Server

From a global prospective, an IVR is a media server that plays some sound files, collects phone user input (DTMF keys) and reacts accordingly by transferring user to other extensions, by playing new sound files and by activating/de-activating some voice features.

This part focuses on the configurable part of IVR that makes it possible to build an automated receptionist service. For example, when dialing 0141877000, a caller will be connected immediately to the IVR. The IVR plays a message such as: 'Welcome to XYZ Company! Enter 1 for sales department, 2 for technical hotline, 0 for an operator.' If the user presses 2, a voice sub-menu can be played or the call is forwarded to the hotline hunt group (multiple phones may ring). An IVR script can play only one message. For example, a second IVR script could announce the following message 'Welcome to XYZ Company! We are open from 9 a.m. to 19 p.m. from Monday to Friday. Please call us again during open hours.' Call Forward Unconditional can be programmed from one IVR to the other during closed hours.

To start configuring the IVR, enter the next command in global CLI mode (not in configure terminal mode):

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> receptionist <0-9>
CLI(receptionist/x)>
```

The next command allows up to two internal phone numbers to connect to IBC and have permission to configure the IVR by phone (such as recording message files). (Optional command)

```
CLI(receptionist/x)> admin-phone {<phone1> | <name1>} [<phone2>|<name2>]
CLI(receptionist/x)> no admin-phone
```

The next command instructs the IVR to playback a (welcome) sound message. If the dial argument is present, the call is forwarded to the phone number after the sound message file is fully played.

```
CLI(receptionist/x)> message [<filename>] [dial <number>]
```

The next command tells the IVR what to do when the user does not press any key on his phone: either hang up or repeat the sound message or forward the call to an extension (this command is optional; by default the IVR waits the input for 10 seconds then hang-up).

```
CLI(receptionist/x)> wait-for-input <3-30 seconds> [then
                              { hangup | repeat | forward-to <number> }]
```

The next command basically tells the IVR what to do when the user has pressed a key on his phone by entering in a voice menu. The user can press 0-9, # and *****. After entering the keypad command the CLI enters in a sub-menu.

```
CLI(receptionist/x)> [no] keypad { <0-9> | # | * }
CLI(keypad-level1)>
```

In a voice sub-menu, the same `message` command is available. Additionally, an action is possible: either to forward the call to an extension or to go to the voice menu or to wait for another keypad, or to repeat the message.

```
CLI(keypad-level1)> message [<filename>] [dial <number>]
                    { dial <number>
                    | previous-level
                    | keypad { <0-9> | # | * }
                    | repeat }
```

To display the current receptionist configuration, enter the command:

```
CLI(receptionist/x)> display
```

3.1.9 IBC Voice Feature Configuration

If your product is configured with all arguments detailed above, your IBC is up and running. You can now activate some voice feature per CLI.

Most of the CLI commands are also available to "normal" users. Please refer to 2.2 User's Guide with CLI commands for the description of these commands.

The other commands are described hereunder.

3.1.9.1 Dial Command

This command calls first the desired user and if responding it connects the called user with the calling user. This command is the basis to build a click-to-dial function from a web page.

```
CLI> ibc dial <called-number> <calling-number>
```

3.1.9.2 Voice to email

The administrator must configure the SMTP options and enable the voice to email service in the user configuration:

```
CLI(configure)> smtp local-email <local-email-address>
CLI(configure)> smtp local-name <local-user-name>
CLI(configure)> smtp auth-name <authentication-name>
CLI(configure)> smtp auth-password <authentication-password>
CLI(configure)> smtp server <smtp-server-address>
```

Then the voice to email service of a user must be authorized:

```
CLI(configure)> ibc-service
CLI(ibc)> numbering-plan
CLI(pv-number)> index <id>
CLI(index)> voicemail internal email-notify
```

Email address is set by this command:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> [no] email <email>
```

Voice to email is selected by:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> voicemail internal email-notify [delete | no-attach]
```

3.1.9.3 Voicemail

Internal voicemail mode is set by:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> voicemail internal [responder-only | responder-recorder]
```

The mode `responder-only` sets the voice mail in answering-machine mode, i.e. the system plays a message but will not record voice mail.

The message that is played is selected by:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> voicemail with { standard-announcement
| name-announcement | customized-announcement | temporary-announcement }
```

3.1.9.4 Selecting a Language

Every user can configure the language of his choice. This changes the voice prompts language and potentially the web interface language as well (it depends on web page implementation):

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> language { en | es | fr | pl | ru | reset }
```

Note: the list of available languages is subject to change. `reset` sets the default language (i.e. en).

3.1.10 User number management

3.1.10.1 Resetting parameters

Use the following command to reset the user number configuration (for example in case where the number is assigned to a new user). Used with the `all` parameter, it resets all the parameters configured under `ibc-user-configuration/number` to their default values. It also resets the personal voice mailbox, the personal directory and the personal ringback message. Furthermore, it re-applies the default installation profile to the number.

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> reset-parameters all
```

To reset only the parameters (i.e. neither the mailbox, nor the directory, nor the ringback):

```
CLI(ibc-number)> reset-parameters
```

To reset the parameters and only one of the other elements:

```
CLI(ibc-number)> reset-parameters { mailbox | directory | ring-back }
```

3.1.10.2 Deleting configured services

Use the following to suppress a configured service and the related information:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> delete { cfb | cfd | cfnr | cfu | follow-me | overflow
                                                  | scheduled-cfu }
```

3.1.10.3 Displaying calls log

Use the following command to display the list of received calls and dialed numbers (last 20):

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> calls-log
```

3.1.10.4 Changing web interface password

Use the following command to change the web interface password of the user:

```
CLI> ibc-user-configuration
CLI(ibc-user-config)> number { <name> | <main-number> }
CLI(ibc-number)> web-password { not-encrypted | already-encrypted }
                                      <old-password> <new-password>
```

Note: when `already-encrypted` is used, the password has to be entered already MD5 hashed.

3.1.11 Reset commands available to Administrator

To ease the management of IBC, some reset commands are available to the IBC Administrator.

Use the following command to globally remove the simultaneous ringing function:

```
CLI> ibc reset-service simultaneous-ring
```

Use the following command to reset the phone password of a particular user:

```
CLI> ibc reset-phone-password <main-number>
```

Use the following command to reset the Web password of a particular user:

```
CLI> ibc reset-web-password <main-number>
```

3.1.12 Displayed number format

NB: throughout this chapter, the examples used will refer to "33" as a country code, "0" as national code, "00" as international code.

The displayed number format function is used to manage per-user the format of numbers, between the national format (e.g. 01…) International format (e.g. 00331…), plus format (e.g. +331….).

The administrator defines the three prefixes that will be used for the whole IBC:

- International prefix: to refer to an international call (e.g. 00).
- Country prefix: to refer to the country within an international number (e.g. 33).
- National prefix: to be used within the country (e.g. 0).

```
CLI> configure terminal
CLI(configure)> ibc-service
CLI(ibc)> international-prefix <prefix>
CLI(ibc)> country-prefix <prefix>
CLI(ibc)> national-prefix <prefix>
CLI(ibc)> exit
CLI(configure)> exit
```

Each user afterwards can define the format of his incoming calls numbers (please refer to 2.2.4.5).

- International numbers can be either displayed with “+” followed by the country code (`plus` format), or with the international prefix followed by the country code (`international` format).
- National numbers can be either displayed with “+” followed by the country code (`plus` format), or with the international prefix followed by the country code (`international` format), or with the national prefix (`national` format).

Each trunk can be configured by the administrator to send (please refer to 3.1.3.3):

- International numbers either with “+” followed by the country code (`plus` format), or with the international prefix followed by the country code (`international` format).
- National numbers either with “+” followed by the country code (`plus` format), or with the international prefix followed by the country code (`international` format), or with the national prefix (`national` format).

With:

- `international`: referring to international-prefix // country-code // national-subscriber-number.
- `plus`: referring to + // country-code // national-subscriber-number.
- `national`: referring to national-code // national-subscriber-number.

Use the no form of the commands to remove the configured prefixes:

```
CLI(ibc)> no international-prefix
CLI(ibc)> no country-prefix
CLI(ibc)> no national-prefix
```

3.1.13 Debug and Statistics

To display the list of registered phones and the IP address they registered with, please enter the command:

```
CLI> show ibc user

Phone/User agent        IP address            Status    User name
7010/SJphone            192.168.16.6:5060     idle      Emperor Earth
7020/-                          -             forwarded
7001/-                          -             offline   John
7002/hunting-group              -             ready     Will
7011/-                          -             offline   Charlie
700/-                           -             offline
7021/-                          -             offline   Ted
7030/Aastra 480i        192.168.16.60:5060    idle      Portier
7300/-                          -             offline   J-F Legrand
8000/legacy phone               -             idle      fxs
7080/THOMSON ST2030     192.168.16.61:5060    idle
9200/receptionist               -             ready     ivr
```

Note about the status:

- `idle`: phone is registered, no call active and no call forward.
- `offline`: phone is unregistered.
- `ready`: phone number is in service (for internal services only).
- `busy`: at least, one communication in progress.
- `forwarded`: the user activated CFU or scheduled CFU.

To display information about a number:

```
CLI> show ibc user <main-internal>
```

Example:

```
show ibc user 7080

7080 is idle, sip user [11]
  privilege-level 1, service keypad 1
  service profile 0, install profile 1, call-restriction profile 1
  pickup on, dnd off, ccbs on, screened forward on, clir off
  off-hook-announcement off, ringing timeout 15
  SIP registered, expiry in 37 sec, codec order (alaw,g729)
  IP address 192.168.16.61:5060, MAC address 00:0e:50:4e:70:e1
  User agent THOMSON ST2030 hw3 fw1.54 00-0E-50-4E-70-E1
  IN:  1 calls received
       1 answered, 0 canceled, 0 busy, 0 not answered, 0 peer offline
  OUT: 1 calls made, 0 rejected, 0 not routable
       0 local calls, 0 external calls, 0 internal services
       1 answered, 0 canceled, 0 busy, 0 not answered, 0 peer offline
  Voicemail: off
```

To display IBC statistics:

```
CLI> show ibc statistics

IBC daemon is up since 08 NOV 2007 10:49 (03:03:13)
  SIP interface fastethernet 0/0, registration timer 30 sec, language en
  10 phones configured/limit 20, 1 hunting groups, 1 internal services
  5 phones registered: 5 idle, 0 busy
  0 active calls, 1 max calls reached/limit 10
  Trunk: 126 calls received, 6 not routable
         0 rejected (congestion)
         110 to local users, 0 to trunk, 10 to internal services
         90 established, 7 canceled, 2 busy, 10 not answered
         1 peer offline, 0 server-down
  Local users: 2258 calls received, 25 not routable
         0 rejected (congestion), 2 rejected (restriction-profile)
         1654 to local users, 446 to trunk, 131 to internal services
         2016 established, 84 canceled, 41 busy, 137 not answered
         12 peer offline, 0 server-down
  Voicemail: 3 messages (1 unread), 0 min 13 sec
         3435968 bytes (57 min 15 sec) left on flash disk for voicemail
```

Comments on IBC statistics:

- A maximum number of calls is supported (depends on product). For example, on ONE100 in the statistics above, no more than 10 simultaneous calls can be made. Additional calls will be dropped and the counter "max calls reached" will be incremented.
- The maximum number of external calls on a trunk interface is also limited. Calls dropped because of trunk capacity limitation are counted in the "rejected (congestion)" counter.
- In trunk statistics, the "to trunk" counter designates incoming external calls that are looped to another external called party (tromboned call).
- Restriction profiles: every user can be associated with an outgoing call restriction profile. This profile defines number patterns that can be called or not (e.g. to forbid dialing to toll phone services).
- Voicemail: the number of bytes represents the space that is effectively available for voice mail. This is not the whole flash space (a margin is taken).

To display global call statistics:

```
CLI> show ibc statistics { global | phone <number> | trunk <id> }
```

Examples:

```
show ibc statistics phone 7010

Phone 7010:
  IN:  256 calls received
       244 answered, 4 canceled, 0 busy, 8 not answered, 0 peer offline
  OUT: 189 calls made, 0 rejected, 0 not routable
       45 local calls, 134 external calls, 12 internal services
       161 answered, 11 canceled, 0 busy, 17 not answered, 0 peer offline
  Voicemail: 1 messages (1 unread)/max 20, 13 seconds/max 180
```

To display SIP statistics:

```
CLI> show ibc statistics sip

SIP listening on 192.168.16.250:5060 using internal sip proxy
  IN:  323 messages, 0 too short, 0 malformed
       301 requests, 0 unknown
```

```
            125 REGISTER, 170 OPTIONS, 0 NOTIFY, 0 REFER
            2 INVITE, 0 CANCEL, 2 BYE, 0 INFO, 0 MESSAGE
            2 ACK, 0 PRACK, 0 SUBSCRIBE, 0 UPDATE, 0 PUBLISH
          22 responses, 0 unknown, 0 wrong
            10 1xx, 12 2xx, 0 3xx, 0 4xx, 0 5xx, 0 6xx
     OUT: 444 messages
          16 requests, 0 unknown
            0 REGISTER, 0 OPTIONS, 0 NOTIFY, 0 REFER
            6 INVITE, 0 CANCEL, 2 BYE, 0 INFO, 0 MESSAGE
            8 ACK, 0 PRACK, 0 SUBSCRIBE, 0 UPDATE, 0 PUBLISH
          428 responses, 0 unknown
            129 1xx, 129 2xx, 0 3xx, 170 4xx, 0 5xx, 0 6xx
```

To reset the statistical counters of SIP, run:

```
CLI> clear ibc sip counters
```

To reset the global statistical counters of IBC, run:

```
CLI> clear ibc statistics
```

To reset the statistical counters of all users, run

```
CLI> clear ibc user
```

To reset the statistical counters of a specific user, run

```
CLI> clear ibc user <number>
```

To display all unconditional call forwards set to a number:

```
CLI> show ibc cfu-to <number>
```

To display information about trunks:

```
CLI> show ibc trunks
```

The following events are notified through system log facility, IBC server daemon shutdown and restart local phone registration and unregistration file system full (failure to save voicemails).

The following is a sample output:

```
12:09:13.194 #INFO# IBC: phone 7030 registered at 192.168.16.60:5060
12:09:16.274 #INFO# IBC: phone 7080 registered at 192.168.16.61:5060
12:09:30.581 #INFO# IBC: phone 7010 registered at 192.168.16.6:5060
12:58:40.695 #INFO# IBC: phone 7010 unregistered upon timeout
13:02:38.270 #INFO# IBC: phone 7010 registered at 192.168.16.6:5060
```

The event log is enabled by default. To disable the event log for IBC server, run:

```
CLI> configure terminal
CLI(configure)> ibc-service
CLI(ibc)> [no] log events
```

To debug an IBC call, use the debug command:

```
CLI> debug ibc call
```

The following is the output trace when the local phone 7080 calls a 7002 which is a hunting group.

```
13:17:16.868 IBC: [5] new call 7080->7002 received from user
13:17:16.966 IBC: [5] call 7080->7002 hunting group 1
13:17:17.131 IBC: [5] call 7080->7010 dialing 7010
13:17:17.142 IBC: [5] call 7080->7011 phone offline
13:17:17.150 IBC: [5] call 7080->7021 dialing 7021
13:17:23.929 IBC: [5] call 7080->7010 in conversation
13:17:53.823 IBC: [5] call 7080->7010 hung up
```

To enable the debug trace of call flow for a specific phone, run

```
CLI> debug ibc phone <number>
```

Whenever a configuration is done (changing a service for a user, adding/removing a phone number ...), a trace of the change is displayed by means of the next command:

```
CLI> debug ibc config
```

To enable the debug trace of the IVR service, run:

```
CLI> debug ibc ivr
```

To enable the debug trace of the voicemail service, run:

```
CLI> debug ibc voicemail
```

To de-activate all debug traces:

```
CLI> no debug
```

3.1.14 Configuration Example

The following example is for an ONE300 with a BRI trunk on port 5/4, an FXS subscriber on port 5/2 and 3 SIP phones. The BRI port simulates the public network, but it is configured in NT mode for connection with an ISDN phone, rather than a connection with a public network.

```
! Built on One300
event filter add vox  all show
configure terminal
hostname one300
interface FastEthernet 0/0
 ip address 192.168.1.10 255.255.255.0
exit
interface Loopback 1
 ip address 192.168.16.250 255.255.255.255
exit
interface bri 5/4
 isdn
  application-interface voip
  protocol-emulation isdn-nt
 exit
 no shutdown
 execute
exit
ip dhcp pool LAN
 network 192.168.1.100 255.255.255.240
 default-router 192.168.1.10
 dns-server 192.168.1.10
exit
dial-peer voice pots 0
 pots-group 0
 port 5/4
 no shutdown
exit
```

```
dial-peer voice pots 10
 pots-group 10
 port 5/2
 no shutdown
exit
dial-peer voice voip 0
 sig-protocol sip
 voip-coder-profile 0
 sip-ua ip-static ibc
 no shutdown
exit
voice-routing
 route 1
  dial-peer pots-group 0
  prefix .  length 0
  prefix-type incoming calling last
  insert-prefix #98 calling
  no loopback-routing
 exit
 route 2
  dial-peer pots-group 0
  prefix #98.  length 3
  prefix-type outgoing called last
  suppress-prefix 3 called
  no loopback-routing
 exit
 route 3
  dial-peer voip 0
  prefix .   timer
  prefix-type outgoing called last
  no loopback-routing
 exit
exit
sip-gateway
 shutdown
exit
sip-server
 interface loopback 1
 no shutdown
exit
ibc-service
 external-trunk
  trunk 1
   trunk-name BRI
   dial-prefix 0
   routing-prefix #98
   trunk-type sip
  exit
 exit
 numbering-plan
  index 1
   main-number 9000
   alternate-number 6000
   main-external 0198759000
   alternate-external 0198756000
   name SIP1
   service-keypad 1
  exit
  index 2
   main-number 9001
   alternate-number 6001
   main-external 0198759001
   alternate-external 0198756001
   name SIP2
   service-keypad 1
  exit
  index 3
   main-number 9002
   alternate-number 6002
   main-external 0198759002
   alternate-external 0198756002
   name SIP3
   service-keypad 1
  exit
  index 10
   main-number 8000
   alternate-number 5000
   main-external 0198758000
   alternate-external 0198755000
   name FXS1
   number-type legacy-subscriber pots-group 0
   service-keypad 1
  exit
 exit
 sip-proxy internal
 interface fastethernet 0/0
 no shutdown
exit
tftp-server address fastethernet 0/0
exit
```